AN AMERICAN RIFLEMAN

Mr. Albin E. McNamara,
196-41- 45th Ave.,
Flushing, N. Y. L' 11/28/36

BATAAN RIFLEMAN

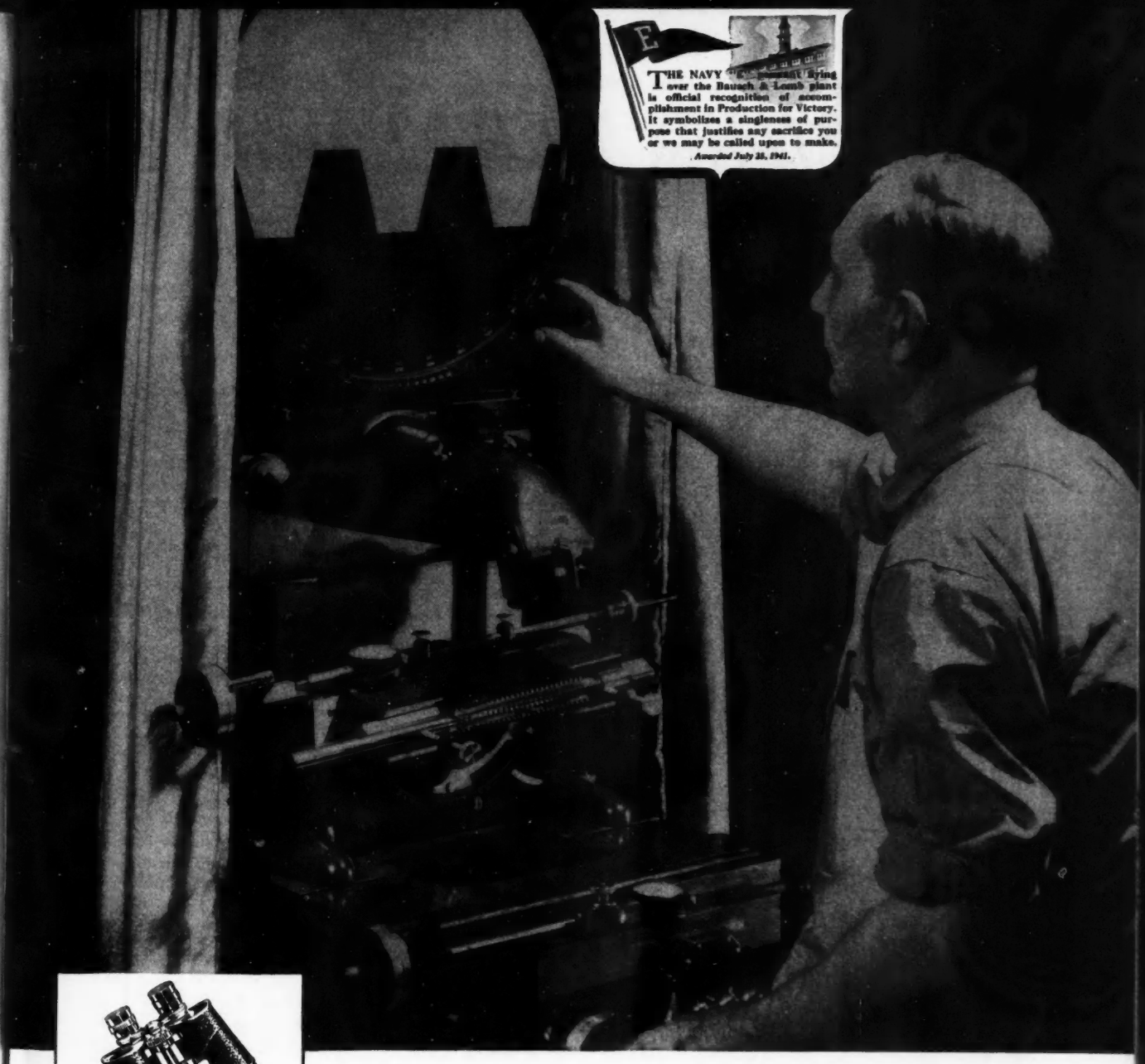
Peter Peepsight makes a Double Play

WHAT IN THE-- WHAT'S THAT THING UNDER YOUR ARM
MY CHEST PROTECTOR SO I WON'T GET ANY MORE STONE BRUISES ON MY CHEST WHEN I SHOOT PRONE
WHO'S THAT, WILLY, AN UMPIRE GETTING HIS REVENGE?
THAT'S PETER PEEPSIGHT, AND DON'T MAKE ANY CRACKS ABOUT HIM, HE'S HOT!- HERE -LOOK AT HIM POURING 'EM IN THE X RING!
C'MON PETE, AND TRY A LITTLE HANDGUN SHOOTING
O.K. WILLY, THAT PISTOL SHOOTIN' LOOKS LIKE FUN
LOOK, WILLY - THIS CATCHER'S STANCE STEADIES ME DOWN
RELAX PETE - STAND UP STRAIGHT YOU'LL SCARE THE TARGET
OF ALL THE GET-UPS - BUT LOOK AT HIM SHOOT - I'LL BET THEY'RE ALL IN THE BLACK
IF HE COULD PLAY BALL WITH A PISTOL, HE'D BE A HOME RUN KING
PETE - YOU SURE SURPRISED ME WITH YOUR PISTOL SHOOTIN'- YOU REALLY POURED 'EM INTO THE TARGET
YEAH! WILLY, YOU TOLD ME WHAT TO DO, AND I USED THESE SAME "POLICE MATCH" .22'S THAT HELP ME BREAK RECORDS WITH MY RIFLE

Willy Bang should have realized that with the help of his coaching and Peters Police Match .22's, Peter Peepsight couldn't help shooting a good score! These cartridges were originally designed for pistol and revolver shooting. In addition, they have proved to be sensationally accurate in small-bore rifles. Used either way, they're straight shooters!

PETERS

DUPONT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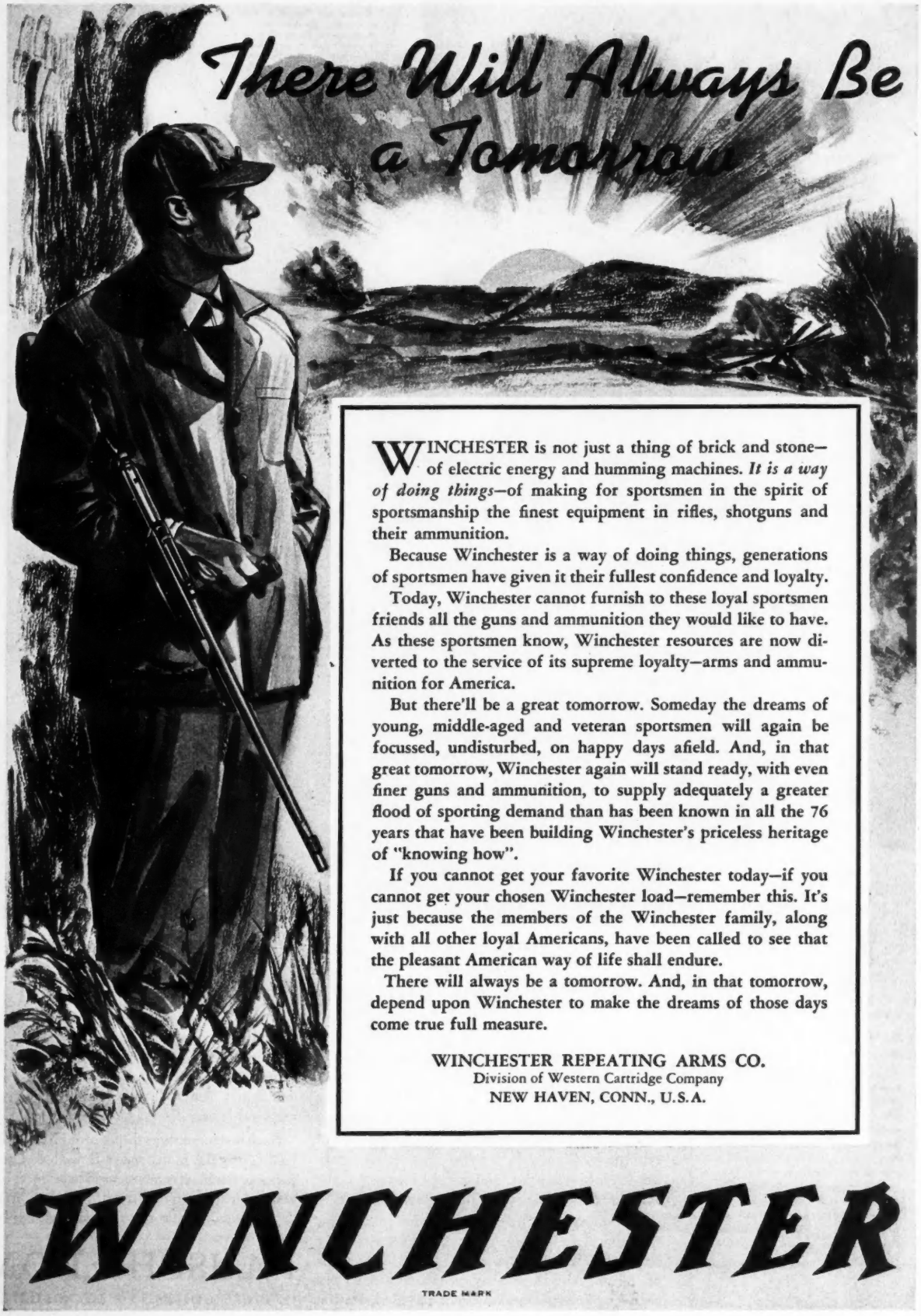

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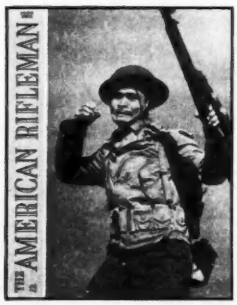
The AMERICAN RIFLEMAN

Official Journal of The National Rifle Association of America



THE COVER: Teamed up with thousands of Americans from the states, the Filipino fighter, in the excitement of battle throwing the grenade baseball fashion just like his fellow American (tho' contrary to the lobbing instruction of his officers) rates cover prominence this month as one of our American riflemen. Inspired by the ferocity of Bataan and Corregidor, recruiting among Filipinos goes on in the States under officers of the Army of the Philippines and regular Army men. Signal Corps Photo.

THIS MONTH, you will want to read our guest editorial, "Specter of Tomorrow" for C. J. Derrick, Los Angeles, California, gets a lot off his chest that has been bothering him—and all of us—these days. And Major Andrew's "What Price Riflemen" provides the sequel to Derrick's inspired article. We've long understood the War Department's interest in Camp Perry, in civilian rifle clubs; now the Major, who will be remembered for "Men at Work" gets down to cases in present recruit training.

NEXT MONTH

IT MIGHT HAPPEN HERE, another of Sgt. Joe McCann's defense articles, this time a three-part serial; an imaginary invasion of continental U. S., the rallying of the "Minute Men" outlined in the condensation of a new NRA booklet (page 26 this issue), the effective resistance by this band of marksmen until regular forces can be brought up to deal with the invader's established beach-head. We sent the Sarge the new booklet, asked him what he thought of it, for he's made a study of such tactics as an officer in one of Uncle Sam's first Parachute Battalions. He came back with a story as the best means of proving practicability of detailed operations in such an emergency.

U. S. MORTARS, another story on Uncle Sam's new armament for the doughboy has, fortunately for us, been passed by the censors although we have no way of knowing how many more of the new guns we can talk about in print.

GERMAN YOUTH TRAINING by S. D. Ludlum. Did you know that the young Nazi is brought up on a diet of American Indian stories, Leather-Stocking tales, German version; that self-reliance—"every man his own general"—is taught through the feats of Winnetou, the great Indian hero and Old Shatterhand, Winnetou's "white brother"; that American Indian lore is now a part of German military science? Like parachute troops or Stonewall Jackson's "blitz" tactics, here's another "steal" from American doctrine we may have overlooked.

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SPECTER OF TOMORROW

YESTERDAY I SAW A GHOST. We were together all day and we have a date for Saturday. For twenty-four years I had been afraid of seeing him, but now that we have met I realize that I should have hunted him up a long time ago instead of avoiding him. It isn't the ghost that's been scaring me, it's been my conscience, and I feel much better now. Maybe you have a ghost too. You ought to get acquainted with him.

Twenty-four years ago I was a "shave-tail" with a narrow-gauge railway regiment in France. We were hauling soldiers into the line—a "fresh" division, relieving what the newspapers called "veterans". The Hun was pounding the English up in Northern France and Pershing was getting set for the Marne. It was a "fresh" division all right—fresh from the draft board. It wasn't their fault and they were getting ready to kick hell out of the best army in Europe, even if they didn't know much about war.

The flat car was jammed with weary, rain-soaked soldiers, clinging to the stanchions as they swayed, and swearing an accompaniment to the chugging and the rattling of the train. I sat on the edge, dangling my wet feet over the side, thinking of hot coffee. Behind me a skinny kid, prematurely aged by a heavy pack, stood with his arms wrapped around a stanchion and his hob-nailed feet on my trench-coat.

He bent over and asked me a question.

I regret to state that my reply commenced with a bitter denunciation of the Government of the United States and its people, going back as far as Plymouth Rock.

He asked me to show him how to load his rifle!

It was dark that night, and rainy. All I could make out was his pleasant apologetic young voice and his cold hands that touched me as we investigated the rifle. Cold hands, like a dead man's. I knew he was going to die, uselessly, because no one had shown him how to load his rifle. What good was it? Why load it? He probably wouldn't hit anything with it. A baseball bat would be handier and more familiar. But I worked with him until we came to the end of the line and when he disappeared into the night, I wanted to go with him and help him carry that dead thing, like a cross on the way to Calvary. How many of them have been crucified—in all our wars?

Since the war, rifle shooting has been a sport to me. No competitive shooting, nothing serious, just relaxation and a little study out of curiosity. Twenty-four years of good, clean fun, doing no one any good except myself. No wonder I was afraid I would see him again.

I wondered why I didn't recognize him when he spoke, his voice coming back over the years, a pleasant, apologetic young voice. Could I show him how to fix his sling?

He was going to be called soon, he said, and his voice was flat, no enthusiasm, no fear. Just a fact, like the sugar shortage or the income tax. I marveled at his courage and then remembered that he, the American boy, had done it before. Perhaps he did it at Valley Forge, learning the hard way to ram "buck-and-ball" into a twelve-gauge musket. He is the "Unknown Soldier," the chap people want to forget until they get into a jam.

We are in a jam. We need guns and ships and planes and tanks, but most of all we need discipline. We need discipline so badly that we are commencing to substitute regimentation for it.

Regimentation is not discipline. Hitler's hordes of "faceless men" have marched all over Europe and his machine looks irresistible. But some day it will crack and fall to pieces because its strength depends upon the mortar and not on the bricks. Discipline is individualistic. It makes men, and out of men one builds an army. The Nazi method is to build an army and fill it with people. There *is* a difference.

For a quarter-century, the people who make up our minds for us—the educators, the journalists, the politicians, the selfseekers—have been attacking American morale from every angle. They have been trying to eliminate from our lives everything that

tended toward the teaching of self-control, which is the basis of discipline. Now, because they are scared, they are rushing around trying to make us march in lock-step, Nazi-fashion, because they cannot understand the difference between discipline and regimentation.

Discipline is self-control. A disciplined soldier is a man who has licked himself.

Only the man who has learned how to control himself can hope to be an expert rifleman. Discipline, good citizenship, marksmanship, they are all tied up together. The national morale in any country, or in any section of any country, fluctuates with the habitual use of arms BY THE ORDINARY CITIZEN! The framers of the Constitution knew this, and said so. That group which, year after year, through ignorance or malice, continues to chisel at our Constitutional right to bear arms, today stands indicted as Public Enemy Number One. They have been afraid of the man who could use arms in his own defense. Now they are begging him to take up arms to defend them.

Well, they are not America and we cannot stop to sort them out. We have a job to do and we had better be about doing it. And while we are about it, let's lay a foundation for the future. Lay a foundation on which we can keep on building national morale after the war. The United States can always use good citizens, people who can control themselves.

Like most of you, I am a small potato, and when I feel that something ought to be done, I start by experimenting on myself—to try it out in a small way. By the time I get going either some "big shot" has organized the thing or the necessity for doing it has passed. So, when I read the dignified editorial complaint in the RIFLEMAN about the waste of trained personnel who might be used as instructors, I dug up my Basic Field Manual and went to studying.

That is the idea I would like to sell you—to do something *personally*, something to help the Association get this thing started.

Actually, we have two jobs to do. One of them is the pre-Army training of our young men and the second in the protection of our dwindling ammunition supply.

There is a definite shortage of ammunition, even .22's. There should be. In the present emergency everything that goes into a .22 cartridge is a critical material, even the paper box in which it is packed. A box of .22's does not represent thirty-five cents. It represents something that can be used to win the war. If it isn't used properly, it's helping the Axis. You don't own that box of .22's. America owns it.

If it were only the waste that hurt maybe we could stand it, but the way it is wasted sometimes does more harm than the waste itself.

Have you been to your range since the public began practicing? Then you've seen the automatics blatting away, eating bullets like a hog does corn. I have no quarrel with an automatic. Our new Army rifle is an automatic and men must learn to use it. But it isn't a garden hose and Garand never intended it as such. What the Army needs is a large volume of AIMED SHOTS, and they are fired ONE AT A TIME!

Every time we permit an unskilled person to empty an automatic rifle at a target, or a tin can, we are creating a bad shooting habit that will require a great deal of ammunition to correct. It seems to me that we are doing the Army, the Nation, and ourselves as riflemen, a great disservice by letting this go on without active protest. I do not mean an official protest by the Association. I mean an active "hell-raising" by the membership, *individually, at the time and place of the crime.* I have tried it, experimentally, and my face is still intact.

I believe we can go farther and compel people who wish to use our ranges to take the pre-firing training which the Army requires of a recruit soldier. Why not? You and I know that no one can attain any degree of skill without understanding the use of sights. Are we justified in allowing people to waste time and ammunition in this emergency, just because they want to participate in a *sport?* Not much.

IT'S NO SPORT NOW!

America is fighting for its life and our winning of this war is going to depend upon the efforts of our citizens as cooperative individuals, not as regimented robots. For the duration, and I hope forever, we must turn away from the doctrine of "do-as-you-damned-please" which has been dinned into us for twenty-four years by the very people who are now screaming for regimentation, rationing and repression.

You say you are waiting for the Association or the Army or the Government to do something. That is the way they do things in Europe, where they manufacture armies of "faceless men." We, *you* and I and our sons, *are* the Association and the Army and the Government! Charity begins at home. Let's start something. Let's go regularly to our ranges, not to shoot but to help other people to learn. Take your tools along. You'll need that precious scope to spot for some beginner. That favored rifle will be just the thing for him to practice trigger squeeze.

I am glad now I met my ghost. He has made things so much easier for me. I don't have to wait for George Marshall to find a place in the Army for me. I am going to help win this war, too. When my ghost goes into battle, I'll be there reminding him to steady down, squeeze them off, to spot his shots and pile up the score. I'm too old to be a soldier, *but I can help make one!* I'd rather be a ghost than be afraid of one.

—Guest Editorial by C. J. Derrick.

By Major

R. C. Andrews,

Infantry, U. S. A.

"ONLY A MAN WITH HIS FEET ON THE GROUND CAN TAKE A POSITION AWAY FROM ANOTHER MAN WHO IS DETERMINED TO HOLD IT. HE IS A RIFLEMAN"

WHAT PRICE

NOW THAT OUR PAPERS are full of blitzkrieg, tanks and airplanes, does a youngster still tell you that his ambition is the all-inclusive one of wanting to be a soldier? He does not. He specifies that he wants to be a pilot, or a tank driver. These specialists get the publicity which captures the popular imagination, even though artillery, tanks, planes and everything else in war are only auxiliaries, assistants, which exist to help *riflemen* forward to take ground away from an enemy!

Only a man with his feet on the ground can take a position away from another man who is determined to hold it. This unspectacular drudge of all armies is the Infantryman. *Fundamentally he is a rifleman.* His principal arm is, and probably always will be, due to its relative ease of transportation and handling, some sort of rifle. In our army it is the Garand semi-automatic rifle.

Fortunately, one part of our Infantryman's training—you would be astonished at the number of other things he must learn—has been simplified by adoption of the Garand rifle. Where formerly, as readers of this magazine know only too well, a tremendous amount of time and practice was required to train a man to shoot well with a Springfield, much less time relatively is required now to train him to shoot the Garand equally as well. The reason? Probably the reduced recoil of the Garand *plus* its better sight equipment. Therefore, we can spend more time on other training calculated to get our riflemen to the spot where he can fire effectively in time to do the most good.

And just what qualities does a good shot have or develop? The first that come to mind are self-control, the ability to keep thinking under pressure, to concentrate on what

he is doing. Lump them together and call them self-discipline. He learns to keep thinking as he fires, evaluating cause and effect, and correcting for better results. He learns habits of precision and care in adjusting his sights and in sighting. He learns to care for his equipment so that it will function perfectly when he calls on it to perform.

Now what is the value to the Infantry of a selectee already trained as a civilian rifleman? To begin with, he has already partially mastered his principal weapon—the rifle. I say partially because he has yet to learn to handle that rifle with a bayonet attached. From his training as a rifleman the qualities that make a good soldier or non-commissioned officer or officer—all are soldiers—are already developed or are developing fast. I have seen a few very good soldiers who were relatively bad shots, compared to the manner in which they executed ordinary duties. Never have I seen a *poor soldier* who was a *good shot*!

The poor soldier is a bad shot because those qualities which he lacks to become a good shot—habits of precision, of analysis, of self-control, of concentration, are precisely those required to become a good soldier. The poor soldier cannot carry out orders because he cannot analyze the reason for them or lacks concentration to attend to the job in hand until it is completed. He lacks the rifleman's control of himself, his ability to bear down and make good—to sink that last shot home. He has not learned precision in caring for his equipment. That extends to such things as carelessness in setting his sights and aiming. He lacks the rifleman's ability to analyze cause and effect.

Many times—other officers interested in shooting will bear me out—I have been able to predict with almost hundred per cent accuracy which of my men would fail to qualify with the rifle and which ones would be borderline cases. By the way they drill, act, talk, care for their equipment, grasp instruction, they stand apart. I repeat that I have never seen a poor soldier who was a good shot.

As well as having inculcated him with these needed qualities, what particular benefit will his rifle training confer on a selectee who is assigned to the Infantry? In the first place I'll venture that he catches on a little more quickly from his first day of drill. As a result he will attract attention to himself and his progress will be closely watched. We are always looking for outstanding men for further training, leading to a non-com's, warrant or an officer's commission.

Following the attainment of some proficiency in ordinary drills the selectee will be taught to shoot. There his training with a civilian rifle club, even if he *were* the club chump, will make him outstanding at once. He probably will be singled out to help with the instruction and coaching of his buddies. He is then invested with some authority and responsibility. As he makes good in his coaching duties a favorable report will go to his company commander, who will look forward to having the selectee sent to full duty with the company in the hope that he can be trained to become a non-com.

Early in 1941 I was given the assignment of teaching 1,400 selectees in my regiment to shoot the rifle. As far as I could learn, my assistants knew only what I had taught them in a brief course preceding mass instruction of the 1,400. *Unfortunately not one man of all those selectees appeared to have had any previous training.* Had I found any they would have been singled out immediately as my assistants, and they would have been wearing a non-com's stripes about as soon as they finished their recruit drill!

In the present Infantry rifle regiment the selectee's chance of becoming purely a rifleman are only two out of three because only about 2,200 men out of approximately 3,400 comprising the regiment are armed with the rifle. The rest are automatic riflemen, light and heavy machine gunners, mortar crew men, or antitank gunners.

What good will a man's rifle training in the local club at home do him behind the grip, or safe, end of a machine gun? A machine gun must be aimed for the first burst; thereafter its fire is adjusted by observation of the strike of the bullets. The selectee certainly has learned to aim a rifle, and sights are sights, so he has nothing new to learn there. He will have a good idea of how the gun works, and will know the importance of keeping it clean and in working order. He will know that wind affects the flight of his bullets, and he will allow for it in order to place that first all-important burst of fire on his target. After a little practice in manipulating the elevating and traversing handwheels our selectee will be a pretty fair gunner.

If he is assigned to a light machine gun squad or to an automatic rifle, now dressed up with a bipod in front and a hinged butt plate, the same things will apply. His rifle training will serve him in even better stead since these weapons are fired from the prone position, and he uses both of these guns pretty much as he would a rifle. Of course he fires more bursts than single shots, *but those bursts must be aimed.*

RIFLEMEN?

If he is assigned to a mortar crew his knowledge of the effects of wind will be of considerable help to him; it is maddening to stand behind recruit gunners and watch them fail to correct for wind currents that frequently drift the projectile wide of the target. There can be no trifling with the leveling of bubbles in the sights, or with the setting of pointers to the exact graduation on a scale—precision which a *trained rifleman* already has acquired in his previous training with the shoulder arm.

If assigned to the antitank guns he will find that there is a premium on fast and accurate aiming and shooting because enemy tanks are his special targets and he is theirs. A trained rifleman will learn his duties quickly, will handle himself well around the gun, and be quick and alert as a member of the crew. Of such is the stuff of corporals, the first step up the ladder of promotion.

The HOW and WHY of Hunting Sights

By Colonel Townsend Whelen

If you are a one-trip-a-year hunter, or a volunteer in your local home guard outfit, or just a fellow who owns a rifle and likes to shoot it, this article has been prepared for you.

How about those sights? Did you sight the rifle in and adjust the sights when you got it, or are you still shooting with the "factory adjustment?" Did you re-sight it after changing ammunition that time? How about allowing for bullet drop on long shots, and estimating distances—on deer or Japs! All of these things are easy to learn, and once you do get them in your mind, they'll stick from now on.

First of all, there are some basic facts to remember about bullet behavior—things that happen to all bullets, from .22's to the big Army rifles. These things affect the little matter of putting a shot on a target without too much guess work. Here they are.

When a bullet is fired from a rifle it starts to drop to the ground just as soon as it leaves the barrel. Like any other object it starts to drop slowly, and as it drops its speed of drop gradually increases. It may only drop a quarter-inch in the first hundredth of a second, but it will nonetheless drop about 16 feet in its first second of flight. Of course while the bullet is dropping down it is also flying forward very fast so that it does not strike the ground under the barrel, but at a point way to the front. Therefore the path of a bullet through the air is always a curve, and this curve is called the *trajectory*.

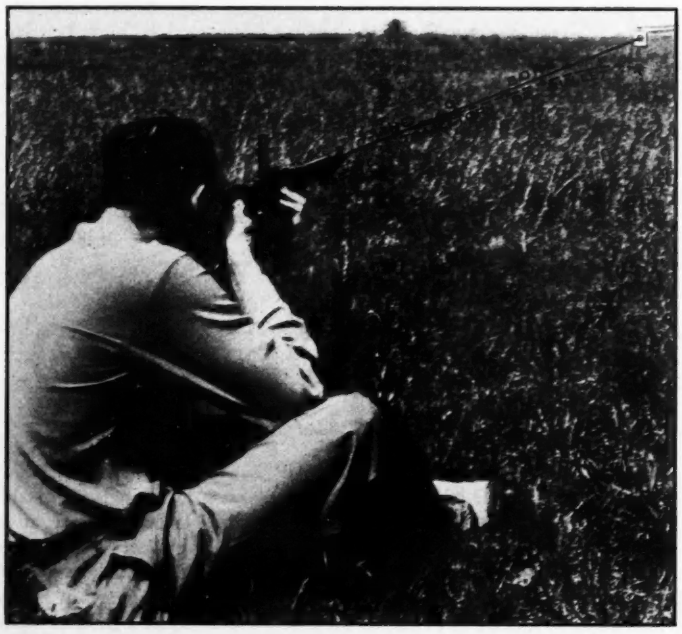


Fig. 1: As soon as any bullet leaves muzzle of rifle, it begins to fall away from line of bore. A bullet so aimed will miss the target

Thus if the barrel (really the bore) of a rifle is aimed straight at a target any distance away the bullet will not strike the target, but some distance under it. In order to strike the target we must incline the barrel upward. The greater the distance of our target the greater must this elevation be to compensate for the greater drop of the bullet. Rear sights on American rifles are graduated with steps or marks so that when we find our correct elevation for a certain distance we can make a record of it and be able to set the sight at that adjustment again.

An attempt is usually made to sight every rifle in at the factory for some minimum distance, usually 50 yards (200 yards with a high power rifle). But this adjustment will not often be right for the shooter who buys the rifle. It is for a certain make and lot of ammunition, and for the eyesight and manner of aiming and holding of the tester at the factory, and the future owner of the rifle won't have the same sort of eyes. Moreover, between the time the rifle leaves the factory and the time it reaches you its sights are often moved or banged against something. So when you buy a new rifle you always have the job of adjusting the sights.

The commonest type of rear sight is a plain open affair having a sliding elevator cut with steps. Sliding the elevator to the rear raises the sight one step at a time. Each of these steps usually elevates the rear sight the equivalent of about 5 inches at 100 yards. There is sometimes a plate on the standing portion of the sight leaf which can be slid up and down for elevation and set by means of a screw for finer adjustment than the steps will permit. There is no certainty or accuracy about such adjustments, and you have to shoot to find the effect of any move. Other slightly better peep rear sights have graduations stamped on them. With such sights we have to measure the distance between each graduation and then calculate its adjusting value.

The best rear sights are graduated in "minutes of angle" and can be adjusted with precision according to tables of angles of elevation. If a certain adjustment causes your bullets to strike say 4½ inches low on the target, you can adjust the sight instantly and with certainty so that your hits average just 4½ inches higher.

With all sights there is a certain principle of adjustment that every shooter must remember. *"Move your rear sight in the direction you wish to move your hits."* Thus if you wish to raise your shots you raise your rear sight, or if you wish to move to the right you move your rear sight to the right.

Now we must put up with a little arithmetic. Don't let it confuse you because it is only a simple case of proportion. Say we find on shooting our rifle at 100 yards that the bullets are hitting 8 inches low. How much must we raise the rear sight to correct for this error?

Measure the distance between your front and rear sights. Say you find it to be 24 inches. In 100 yards there are

3600 inches. Divide 24 into 3600 and you get 150. Then any move of the rear sight you make will move the center of impact 150 times that much on the target at 100 yards. If you raise the rear sight 1/25th of an inch, it will move the center of impact 6 inches at 100 yards, or 12 inches at 200, or 18 inches at 300 yards.

Suppose your rear sight is graduated as shown in Figure 4, and the distance between front and rear sights is 30 inches. By measuring the graduations on the sight you find, let us say, that there is just a quarter of an inch between the long graduations. This distance is divided into five parts by the shorter lines. Therefore each of the smaller graduations is 5/100ths of an inch apart. We apply our rule and we find that one of the small graduations will raise or lower the center of impact 6 inches at 100 yards, or 12 inches at 200 yards and so on. We could perhaps see to move this sight half a graduation, but even this would give us a change of 6 inches at 200 yards—not very good for a fine rifle that is supposed to be capable of staying in the 4-inch 10 ring at that distance. With just a little intelligent practice you can work up to the point where you can hit much closer than 6 inches at 200 yards if your sight permits of accurate enough adjustment.

Fig. 2: Use of elevating rear sight actually raises muzzle of rifle, causing the path of bullet and line of sight to coincide at target

Minute of Angle Adjustment

Now let us turn to the "minute of angle" sight. First of all, a rifle shooting the .22 Long Rifle Regular cartridge requires angles of elevation of 15, 33, and 54 minutes to compensate for the drop of the bullet at 100, 200, and 300 yards. A minute of angle means 1.047 inch at 100 yards. For simplicity we call it an even inch. Thus a minute is an inch at 100 yards, 2 inches at 200, 3 at 300 or 6 at 600. Elevating our sight 15 minutes at 100 yards thus means raising our hits 15 inches—the amount of the drop of the bullet at that distance. As we have said, our best sights are graduated in minutes of angle, and many of them are capable of being adjusted, recorded and read to quarter minutes. A quarter minute change of course gives just one-fourth of this adjustment or ¼ inch at 100 yards. Simply memorize the rule *"A minute equals an inch for each hundred yards of range."*

Here is a table of angles of elevation which you can use in adjusting minute of angle sights:

Cartridge	*100 Yards*		*200 Yards*		*300 Yards*	
	Drop. Inches	*Angle of elev. Minutes*	*Drop. Inches*	*Angle of elev. Minutes*	*Drop. Inches*	*Angle of elev. Minutes*
.22 Long Rifle Reg. M. V. 1100 f. s.	15	15	66	33	162	54
.22 Hornet M. V. 2600 f. s.	2	2	9.4	4.7	34.5	11.5
.30-'06 M2 M. V. 2700 f. s.	2	2	9.0	4.5	22.5	7.5
.220 Swift M. V. 4000 f. s.	.5	.5	2.0	1.0	9.0	3.0

Minute of angle sights are constructed on the same principle as the machinist's micrometer, thus making them quick and easy to adjust, to read and to make a record of. The Lyman No. 48 sight illustrated is typical of all of them. The slide is graduated with lines which are five minutes apart. The screw head at the top is graduated around its circumference with longer lines numbered from 0 to 4 which are minutes, and also with shorter lines in between which are quarter minutes. Turning the screw head one complete revolution moves the sight up or down five minutes. Turning it through one of the longer graduations, that is from 0 to 1 moves the sight one minute. The sight is easily read. If the index line on the slide points a trifle less than half-way between the 10 and 15 lines on the slide, and the No. 2 line on the screw head is in line with its index we have 12 minutes of elevation, that is, the reading on the slide plus the reading on the head. All other minute of angle sights are on the same principle.

Many of these sights click for each quarter minute, and you can feel every time the head passes a quarter minute, and the sight can be clicked up and down by feel. For this reason riflemen often call the quarter minute a "click." A click is of course equivalent to a change of a quarter inch per hundred yards. When you are shooting to place all your shots in the X-ring of the small bore target (1 inch at 100 yards) a quarter minute adjustment becomes a highly necessary refinement.

Sighting In

Now for the application. Suppose you have a brand new rifle to sight in. You are not sure that the sights were adjusted at the factory, and anyhow you or someone else has probably monkeyed with them since it left the manufacturer. If it is a .22 rim-fire rifle you will probably want to sight it in for a minimum distance of

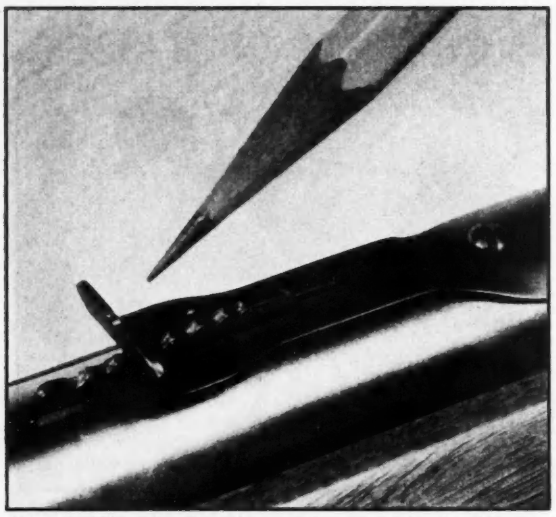


Fig. 3: The simplest form of rear sight is this leaf affair with step wedge to give necessary elevation

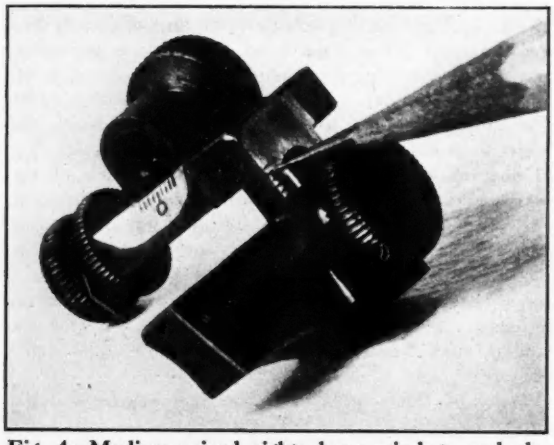
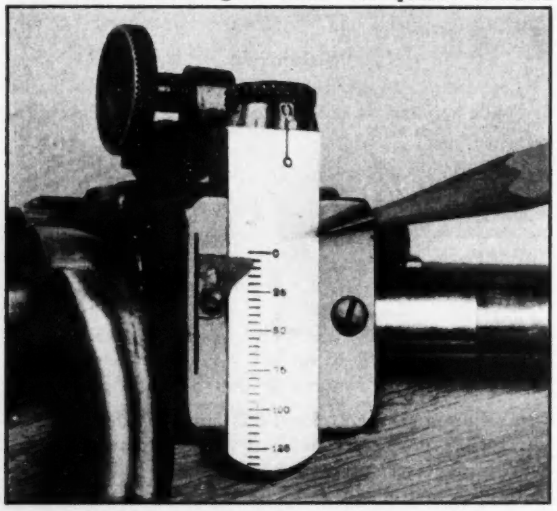


Fig. 4: Medium-priced sights have windage and elevation scales, but must be adjusted by eye. Pencil indicates graduation equal to 6-inch move at 100-yds.

Fig. 5: Typical "minute-of-angle" sight is this Lyman 48. Reading here is 5 minutes on elevation scale, 0 on knob. Such sights "click" for quarter minutes



50 yards; if it is a high-velocity center-fire rifle you will probably want to sight it in basically for 100 yards. Now, if you start to sight this new rifle in at 100 yards the sights may be so far off in adjustment that you could fire 50 rounds, adjusting the sight every two or three shots, before you finally found an adjustment that would cause a bullet to strike the target. So with a new or unknown rifle, to save ammunition and time, set up a full sized 100 yard target at only 10 yards. At this short distance your first shot will almost certainly strike somewhere on the large paper target, no matter how much the sight is off, and you will then know in what direction to move the rear sight to place the next shot closer to the bullseye. Have the bore and chamber of your rifle wiped clean and dry. Fire on the 10 yard target from a steady sandbag or bench rest. Suppose the first shot strikes 4 inches below where you aimed. At 10 yards a minute has an adjusting value of 1/10 inch. Therefore screw your rear sight up 40 minutes and shoot again. Now your bullet should strike just where you aimed. You can now take the target back and tack it up at 100 yards with the assurance that when you fire at it your bullet will surely strike somewhere fairly close to the bullseye. At 100 yards you now fire three shots at the target. Suppose these three shots make a little triangle, and the center of this triangle (center of impact) is 3 inches above where you aimed. Lower your elevation 3 minutes and shoot a few more shots. These shots should strike where you want them to. Now your rifle is sighted in for 100 yards *for the particular make and lot of ammunition you used*, and for *your manner of aiming and holding*.

Now look at your sight. Let us say that it reads 38 minutes elevation. Such a reading is inconveniently high. So you unscrew the little index plate on the side of the sight and slip it up until it points between the zero and the five graduations on the slide, and clamp it there. Your sight now reads 3 minutes, slightly more than zero on the slide, and 3 on the screw head. In your note or score book you now set down "For 100 yards with such and such ammunition, shooting from sandbag rest, elevation is 3 minutes."

This 3 minute elevation is now your starting point for other ranges. Suppose you have been shooting a .30-'06 rifle using M2 ammunition. From the table at the beginning of this article you will see that the angles of elevation are 2 minutes at 100 yards, 4½ minutes at 200 yards, and 7½ minutes at 300 yards. You have just found that the basic 100 yard elevation for your individual rifle and the ammunition you used is 3 minutes. Therefore your 200 yard elevation should be 5½ minutes, and for 300 yards 8½ minutes.

Thus far we have considered shooting to strike exactly where you aim. If you aim at "6 o'clock," on the bottom edge of the bull, and yet you wish to strike in the center of the bull, supposing the black aiming bullseye is 6 inches in diameter at 100 yards, then you should add 3 minutes to the above elevation to bring your center of impact up 3 inches to the center of the bullseye.

Windage

So far we have considered elevation only, that is, up and down adjustment. Lateral adjustment is just as important. You can miss the target by shooting to the right or left of it just about as easily (*Continued on page 20*)

Remembering SHOOTING-FLYING

A KEY WEST LETTER

By Ernest Hemingway

THERE IS A HEAVY NORTHER BLOWING; the gulf is too rough to fish and there is no shooting now. When you are through work it is nearly dark and you can ride out on the boulevard by the sea and throw clay targets with a hand trap against this gale and they will dip and jump and rise into strange angles like a jacksnipe in the wind. Or you can throw them out with the gale behind them and they will go like a teal over the water. Or you can get down below the sea wall and have some one throw them out high over your head riding the wind, but if you puff one into black dust you cannot pretend it was an old cock pheasant unless you are a better pretender than I am. The trouble is there isn't any thud, nor is there the line of bare trees, nor are you standing on a wet, leaf-strewn road, nor do you hear the beaters, nor the racket when a cock gets up and, as he tops the trees, you are on him, then ahead of him, and at the shot he turns over and there is that thump when he lands. Shooting driven pheasants is worth whatever you pay for it.

But when you cannot shoot you can remember shooting and I would rather stay home, now, this afternoon and write about it than go out and sail clay saucers in the wind, trying to break them and wishing they were what they're not.

When you have been lucky in your life you find that just about the time the best of the books run out (and I would rather read again for the first time *Anna Karenina, Far Away and Long Ago, Buddenbrooks, Wuthering Heights, Madame Bovary, War and Peace, A Sportsman's Sketches, The Brothers Karamazov, Hail and Farewell, Huckleberry Finn, Winesburg, Ohio, La Reine Margot, La Maison Tellier, Le Rouge et le Noire, La Chartreuse de Parme, Dubliners,* Yeats's *Autobiographies* and a few others than have an assured income of a million dollars a year) you have a lot of damned fine things that you can remember. Then when the time is over in which you have done the things that you can now remember, and while you are doing other things, you find that you can read the books again and, always, there are a few, a very few, good new ones. Last year there was *La Condition Humaine* by André Malraux. It was translated, I do not know how well, as *Man's Fate,* and sometimes it is as good as Stendhal and that is something no prose writer has been in France for over fifty years.

But this is supposed to be about shooting, not about books, although some of the best shooting I remember was in Tolstoi and I have often wondered how the snipe fly in Russia now and whether shooting pheasants is counter-revolutionary. When you have loved three things all your life, from the earliest you can remember; to fish, to shoot and, later, to read; and when, all your life, the necessity to write has been your master, you learn to remember and, when you think back you remember more fishing and shooting and reading than anything else and that is a pleasure.

You can remember the first snipe you ever hit walking on the prairie with your father. How the jacksnipe rose with a jump and you hit him on the second swerve and had to wade out into a slough after him and brought him in wet, holding him by the bill, as proud as a bird dog, and you can remember all the snipe since in many places. You can remember the miracle it seemed when you hit your first pheasant when he roared up from under your feet to top a sweet briar thicket and fell with his wings pounding and you had to wait till after dark to bring him into town because they were protected, and you can feel the bulk of him still inside your shirt with his long tail up under your armpit, walking in to town in the dark along the dirt road that is now North Avenue where the gypsy wagons used to camp when there was prairie out to the Des Plaines river where Wallace Evans had a game farm and the big woods ran along the river where the Indian mounds were.

I came by there five years ago and where I shot that pheasant there was a hot dog place and filling station and the north prairie, where we hunted snipe in the

From ESQUIRE
February, 1935*

TOO FINE TO REMAIN BURIED AND FORGOTTEN: A GREAT SHOOTING STORY BY A GREAT AMERICAN WRITER

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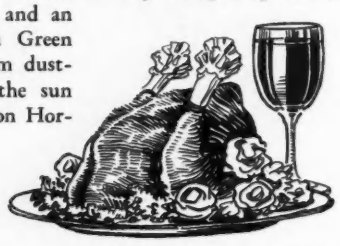
spring and skated on the sloughs when they froze in the winter, was all a subdivision of mean houses, and in the town, the house where I was born was gone and they had cut down the oak trees and built an apartment house close out against the street. So I was glad I went away from there as soon as I did. Because when you like to shoot and fish you have to move often and always further out and it doesn't make any difference what they do when you are gone.

The first covey of partridges I ever saw, they were ruffed grouse but we called them partridges up there, was with my father and an Indian named Simon Green and we came on them dusting and feeding in the sun beside the grist mill on Horton Creek in Michigan. They looked as big as turkeys to me and I was so excited with the whirr of the wings that I missed both shots I had, while my father, shooting an old lever action Winchester, killed five out of the covey and I can remember the Indian picking them up and laughing. He was an old fat Indian, a great admirer of my father, and when I look back at that shooting I am a great admirer of my father too. He was a beautiful shot, one of the fastest I have ever seen; but he was too nervous to be a great money shot.



Then I remember shooting quail with him when I do not think I could have been more than ten years old, and he was showing me off, having me shoot pigeons that were flying around a barn, and some way I broke the hammer spring in my single barrel 20 gauge and the only gun down there at my Uncle's place in Southern Illinois that no one was shooting, was a big old L. C. Smith double that weighed, probably, about nine pounds. I could not hit anything with it and it kicked me so it made my nose bleed. I was afraid to shoot it and I got awfully tired carrying it and my father had left me standing in a thickety patch of timber while he was working out the singles from a covey we had scattered. There was a red bird up in a tree and then I looked down and under the tree was a quail, freshly dead. I picked it up and it was still warm. My father had evidently hit it when the covey went up with a stray pellet and it had flown this far and dropped. I looked around to see nobody was in sight and then, laying the quail down by my feet, shut both my eyes and pulled the trigger on that old double barrel. It kicked me against the tree and when I opened it up I found it had doubled and fired both barrels at once and my ears were ringing and my nose was bleeding. But I picked the quail up, reloaded the gun, wiped my nose and set out to find my father. I was sick of not hitting any.

"Did you get one, Ernie?"

I held it up.

"It's a cock," he said. "See his white throat? It's a beauty."

But I had a lump in my stomach that felt like a baseball from lying to him and that night I remember crying with my head under the patchwork quilt after he was asleep because I had lied to him. If he would have waked up I would have told him, I think. But he was tired and sleeping heavily. I never told him.

So I won't think any more about that but I remember now how I broke the spring in the 20 gauge. It was from snapping the hammer on an empty chamber practicing swinging on the pigeons after they wouldn't let me shoot any more. And some older boys came along the road when I was carrying the pigeons from the barn to the house and one of them said I didn't shoot those pigeons. I called him a liar and the smaller of the two whipped hell out of me. That was an unlucky trip.

On a day as cold as this you can remember duck shooting in the blind, hearing their wings go whichy-chu-chu-chu in the dark before daylight. That is the first thing I remember of ducks; the whistly, silk-tearing sound the fast wingbeats make; just as what you remember first of geese is how slow they seem to go when they are traveling, and yet they are moving so fast that the first one you ever killed was two behind the one you shot at, and all that night you kept waking up and remembering how he folded up and fell. While the woodcock is an easy bird to hit, with a soft flight like an owl, and if you do miss him he will probably pitch down and give you another shot. But what a bird to eat flambé with armagnac cooked in his own juice and butter, a little mustard added to make a sauce, with two strips of bacon and pommes soufflé and Corton, Pommard, Beaune, or Chambertin to drink.

Now it is colder still and we found ptarmigan in the rocks on a high plain above and to the left of the glacier by the Madelener-haus in the Vorarlberg with it blowing a blizzard and the next day we followed a fox track all day on skis and saw where he had caught a ptarmigan underneath the snow. We never saw the fox.

There were chamois up in that country too and black cock in the woods below the timber-line and big hares that you found sometimes at night when we were coming home along the road. We ate them jugged and drank Tyroler wine. And why, today, remember misses?

There were lots of partridges outside of Constantinople and we used to have them roasted and start the meal with a bowl of caviar, the kind you never will be able to afford again, pale grey, the grains as big as buck shot and a little vodka with it, and then the partridges, not overdone, so that when you cut them there was the juice, drinking Caucasus burgundy, and serving French fried potatoes with them and then a salad with roquefort dressing and another bottle of what was the number of that wine? They all had numbers. Sixty-one I think it was.

And did you ever see the quick, smooth-lifting, reaching flight the lesser bustard has, or make a double on them, right and left, or shoot at flighting sand grouse coming to water early in the morning and see the great variety of shots they give and hear the cackling sound they make when flighting, a little like the noise of prairie chickens on the plains when they go off, fast beat of wings and soar, fast beat of wings and soar stiff-winged, and see a coyote watching you a long way out of range and see an antelope turn and stare and lift his head when he hears the shotgun thud? Sand grouse, of course, fly nothing like a prairie chicken. They have a cutting, swooping flight like pigeons but they make that grouse-like cackle, and with the lesser bustard and teal, there is no bird to beat them for pan, the griddle or the oven.

(*Continued on page* 15)

LEADING AND ACCURACY

By R. C. SKAGGS

ALL TOO OFTEN THE BLAME for an unsatisfactory condition is misplaced. No one knows this better than the handgun shooter. Alibis for a misplaced shot are numerous and sometimes comical; people seldom give the real reason for a poor showing even if they know it.

Many revolver shooters worry about leading in a revolver barrel and assume that the load they are using must be very inaccurate, merely because it leads. The blame for this condition is placed on the gun by some while others assume that their bullet is not of the right hardness or that the lubrication is at fault.

Let us consider the barrel condition first. In a new gun the barrel has a uniform finish from one end to the other, yet it leads at the breech end with ordinary loads while the muzzle is usually free of it. With very heavy loads the breech end is free of lead while the bore a few inches from the muzzle is fouled. From my own experience I have come to a firm conviction that when using a heavy load the lead is melted off the bore at the breech end and it is only when the heat of the burning charge has subsided to some extent that the lead is deposited on the bore. While experimenting with various charges of 2400 in the long barreled Magnum revolver I have watched the deposit of lead move forward in the bore as the charge was increased and back as it was lowered.

Right here incidentally is a good place to say that in my experience 14-grains of 2400 is the absolute maximum I would recommend for a tin-lead alloy bullet in the Magnum. Accuracy falls off above this charge for me. But back to the problem of leading.

I have had evidence of this melting with heavy charges in the .30-'06 as well as in the .38 revolver. Some time ago I bought a nice big book devoted to handloading, and found a load of 45-grains of HiVel with the 169-grain gas-check bullet listed in it. It sounded like a natural for varmints and running jack rabbits. Without delay, I loaded up a pocket full, but to make a long story short, I never even got sighted in. I couldn't hit near enough to anything to tell which way to move my sights. It would have taken a six-foot circle at 100 yards to catch all the shots. I noticed that it was a clean-shooting load however. There wasn't a bit of unburned powder in the bore nor a speck of lead, but the end of the muzzle was coated with a wash of lead—smeared up like a possum in persimmon time. The answer seemed to be that the powder blast was hot enough to keep all of the lead melted out of the bore.

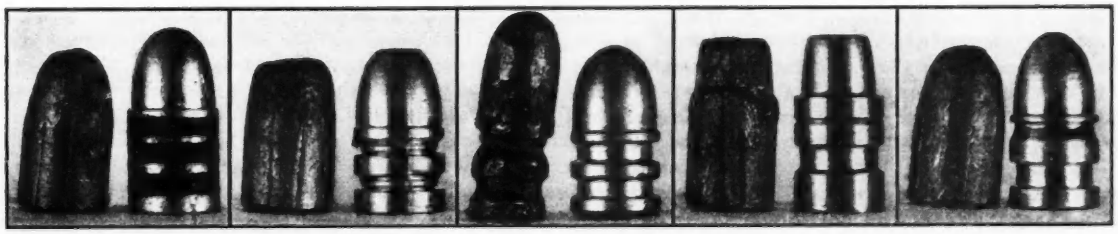
W. E. Spangle of primer-catcher fame also tried a clean-shooting load which developed a similar pressure with another powder. It not only left the gun clean but would leave the target clean. He couldn't hit anything with it, and neither could anyone else. The pay-off came when a group of us were on the way to our testing field one day. A rabbit got up and started legging it across a dry plowed field. W. E. got in the first shot with that high-powdered cast-bullet load and never even hit the plowed field. The rest of us started to laugh so hard we couldn't get in a shot. W. E. emptied the gun and never even raised a speck of dust. We still laugh about that, and so does he whenever reminded of it. After trying that load some more, we came to the conclusion that it was so hot that the bullet was completely melted and atomized as it left the gun.

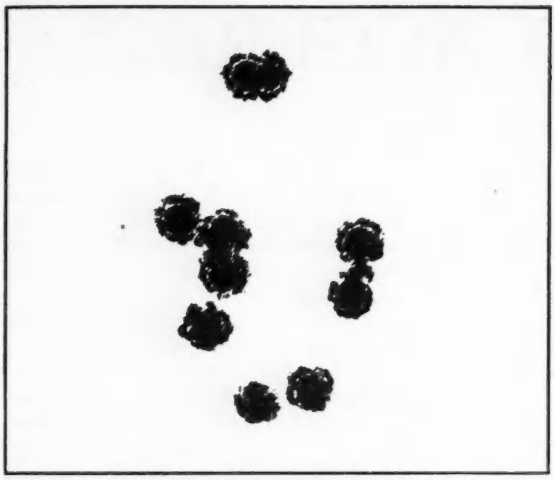
My first revolver reloading was for a Colt .45 New Service target arm. The only lead trouble I ever had with that gun was the problem of finding enough of it to mold those big 255-grain slugs and keep my practice up. I was living in northern Arizona at the time and the lead deposit of that part of the country is richer as a result. Later on I got a Smith & Wesson for the .45 auto cartridge and a case of Winchester ammunition for it. It was of course the metal-cased bullet. By the time I had finished with the case the barrel was so slick it would have been hard to get lead or anything else to stick to it. As a matter of fact the gun was a commercial model and the barrel was beautifully smooth to start with.

I have always had an especial liking for this gun. It seems that I can hit better with it than I expect to. Later, in one of those horse-trades that shooters so often indulge in, I acquired a new Shooting Master of .38 caliber. Spangle got one about the same time. Some time later Spangle told me his new gun leaded with any kind of load he put through it. How about mine? I hadn't done any shooting yet, but told him that neither of my .45's had ever shown more than the merest trace of leading with any kind of a load I had rolled.

That was the start of some exhaustive experimenting on his part to eliminate the lead. Any kind of a cast bullet of any hardness with any kind of lubricant would lead when using ordinary pistol powder. With No. 80 powder it would shoot clean. I have since found that duPont 4759 and Hercules Unique will sometimes also give relief from leading. With No. 80 the most satisfactory charges have been from 6 to 7 grains with bullets of around 158-grains. duPont 4759 bulks up more and a grain or two more is needed with it. I can't yet give

Thirty-eight caliber bullets recovered from the author's sand trap backstop





Fifty-yard target fired by the author with a S. & W. .38. Shown actual size, the group is remarkable for having been fired from a roughened and worn barrel

the exact charge for best results in the .38 with this powder as I haven't run a machine-rest test. I expect to do so but want to finish a test with the .45 S. & W. which I have in the rest now. I want only to mention powder charges in this article insofar as they relate to leading, but if I mention that No. 80 will give relief from leading some shooters are likely to try it and if they use the charges listed in some of the books on reloading they will be in for a bad time. With Unique I would not load less than 4.7-grains nor more than 5.3-grains with a bullet of about 158-grains.

Spangle, noting that factory ammunition gave less leading than most reloads, reasoned that there might be some virtue in swaging rather than molding a bullet, so he proceeded to make a swaging outfit. He made an adjustable mold to cast the slug for swaging, in order that he might make any desired weight of bullet. The bullet was designed to have a base band of groove diameter while the forward portion of the bullet would be of bore diameter and ride the lands. The base band was about ¼-inch wide and beveled at the base to use a graphite-coated wax wad for lubrication, since there were no grease grooves. This bullet did not leave a trace of lead with ordinary charges of pistol powder, even with good stiff loads of No. 5. About this time he came across a new but obsolete Winchester mold for a .38 long round-nose bullet with a bevel base. It measured .358-inch as cast. He found that this bullet, when loaded without sizing and using a wax wad, did not lead at all.

I wanted to try some wax wads but did not like the idea of dipping cold bottles in melted wax nor the idea of making a pressure gun to squeeze out ribbons. I thought I could figure out some easier and more satisfactory way. The first trial showed I was on the right track. I simply put a pan of water on the stove and a chunk of wax in the water. When the water got warm enough to melt the wax I set it off to cool. When the wax was melted it covered the water with a film of uniform thickness, then when it hardened I ran a knife around the edge and lifted my wax sheet off the water. The only trouble was that water vapor formed as the wax was cooling and made some bubbles in the resultant wax sheet. Next time I set a pan of cool water on the bench, put my wax in it where it floated, then turned the blow torch on the chunk of wax. I played the flame on the wax just enough to cause it to flow out in a uniform film over the water. This time I got a sheet of wax free of bubbles. The sheets can be accurately regulated by using a definite weight of wax for each thickness of wad desired. Whenever I wish to use a graphited wax wad I merely lay one of the sheets on a piece of paper and rub some graphite on one or both sides.

Now—when a person wishes to solder a piece of steel he cleans it and applies sufficient heat to melt an alloy of tin and lead (solder) in the presence of a flux. These conditions are exactly duplicated in a gun bore if we consider the bullet lubricant as a flux. This being true, we want to reverse the conditions favorable for a good solder job to prevent leading as much as possible. Of course, the condition of the barrel must remain fixed except insofar as we may coat it with something which will maintain a thin film between it and the bullet.

Many lubricants will do this with a fair degree of success. Even though the heat of the charge burns the lubricant considerably, a residue is left which tends to prevent the adherence of lead from the next shot. This is where graphite is a big help. It not only cuts down on leading but for me at least gives improved accuracy. I melt a stick of lubricant in a tin cup on the stove and add a level teaspoonful of Acheson's Castordag or Oildag, or the same amount of Microfyne. While it is still melted I pour it in the lubricator reservoir. This does away with any air pockets.

The poorest bullet lubricant I have ever tried in point of accuracy was pure beeswax, yet the barrel did not lead with its use. The next poorest was pure paraffin. Although bullets lubricated with paraffin shot better than those lubricated with beeswax, the barrel leaded when using the former. This is just another bit of evidence that the cleanest load is not always the most accurate.

I once asked one of the best shots in this part of the country if his revolver leaded with the load he was using. "Oh sure", he said, "but I clean it out every Christmas". He is often top man at the big shoots and is always near the top. No doubt a nominal amount of leading adversely affects accuracy to some extent but a mere trace is not as bad as some would have us believe. One afternoon I was running a machine rest test when a particular load leaded the barrel noticeably. I did not clean it but kept right on shooting. I was merely trying to see if there was a difference between certain factors and was not trying to measure an amount of difference. The last five 10-shot groups averaged 1¾-inches at fifty yards. The lead simply shot out after a few rounds. It won't always do it though.

I have done some shooting with zinc bullets in revolvers too, and they are prone to "zinc" the barrel badly. It is harder to prevent fouling with zinc bullets than it is with lead alloys. In order to get less fouling with zinc bullets I copper-plated a number of them. I have also done the same thing with lead bullets. Zinc is a very poor bearing metal while copper is much better. Lead and tin however are good bearing metals.

Graphite lubricant also helped keep down the fouling in the use of the zinc bullets. At one time I put fifty lead bullets in a tin can along with a spoonful of Microfyne graphite and shook them until every surface was com-

pletely coated with the graphite. Then I loaded them and shot them with no further lubrication. There was no great amount of lead in the bore and that small amount wiped out easily. I was shooting a Smith & Wesson Magnum with 8¾-inch barrel, merely plinking, and the accuracy seemed about as usual. I mention this experience only to show that graphite has a value in the retarding of leading. As far as accuracy is concerned I expect to cover that later on. I feel that graphite has special virtue in lubricating the passage of the bullet during its first inch or two of travel. It is here that the heat and pressure are greatest and the graphite will neither squeeze out nor burn up. Leading often starts in a revolver in the chamber at the breech end of the barrel. Many revolvers look as if this portion of the barrel had been worked on with a plumber's pipe reamer. I have seen a number of shooters' leading worries eliminated by removing the barrel of their pet handgun and polishing up this chamber as it should have been in the first place. Of course lead sometimes collects in the cylinder but the same measures will get rid of it there.

The amount of upsetting and swaging down a bullet sometimes goes through may be judged by the photographs of some .38 caliber bullets which accompany this article. All of these bullets were fired with less than the maximum charges recommended and recovered from my sand trap after a day's testing. Readers may wonder if they did not upset on hitting the sand and thus obliterate the grease grooves. The answer is no. We have all seen bullets which have struck more unyielding substances and where they were much more upset but with the grease grooves still showing plainly—many times with the grease still in them. I set a micrometer at .360 and could rotate these bullets in it in most cases. One bullet is shown which was elongated rather than shortened. We were conducting a size test at the time this happened and this bullet was sized to .356½. Apparently the gas got around it before it started to move forward. I don't know how or why it happened but I have seen it before and have also had .45 caliber bullets do the same thing with an overload.

Another point to think about is barrel condition. Many times a shooter will look at a neglected barrel and wonder if it is so rough that it will lead badly. A target is illustrated which was made with a Smith & Wesson .32-20 which a deputy sheriff wanted tested to see if it would shoot well enough to use as a service weapon. The grooves were darkened the entire width and length of the barrel, so that they reflected no light. The lands reflected light for their entire length. The bullets used were cast in a Winchester mold and lubricated with a mixture containing graphite, without sizing. The group shown was made after over a hundred shots were fired and the barrel at the end of the test showed only a trace of lead. No effort was made to refine the accuracy of this load through a careful determination of the correct charge and bullet size.

Sometimes a reloader will speculate on whether the jump of a bullet through the cylinder into the rifling does not increase the tendency of the gun to lead. One afternoon I ran a test of a .38 Special for a fellow shooter, using Hensley's No. 50 bullet which seats deep in the case. We tried six different charges of powder, shooting five 10-shot groups with each, 300 shots in all. After a cleaning patch was run through the barrel it looked perfectly clean. Incidentally only two out of that 300 shots would not go in the ten-ring. One of the shots fired with a heavier charge than the rest was out at the top. Another shot which was fired with one of the lightest charges tested was out at the bottom. Each of these two shots was barely out of the 10-ring and none of the marginal shots showed any tendency toward tipping.

I have always thought that when certain powders shot without leading the gun, it was due to the nature of the residue they left more than to the fact that they might burn with less heat. A fairly heavy charge of No. 80 will shoot without any leading if other conditions are anywhere near right, while even a light charge of No. 5 may result in leading. Surely a heavy charge of 80 will generate more heat than a light charge of 5. During the World War some of the fast-firing artillery copper-fouled badly until steps were taken to reduce it. The final answer was to incorporate some tin in the powder.

Remembering SHOOTING-FLYING

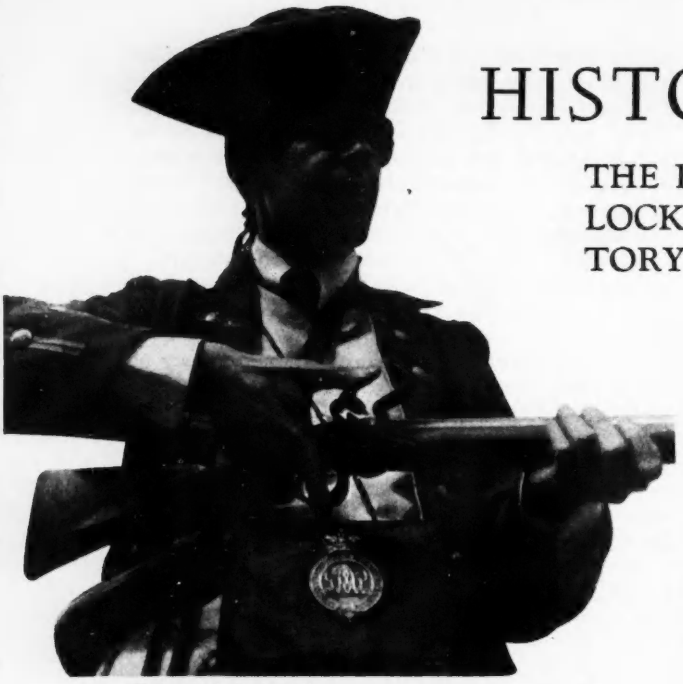
(*Continued from page* 12)

So you recall a curlew that came in along the beach one time in a storm when you were shooting plover, and jumping teal along a water course that cut a plain on a different continent, and having a hyena come out of the grass when you were trying to stalk up on a pool and see him turn and look at ten yards and let him have it with the shotgun in his ugly face, and standing, to your waist in water, whistling a flock of golden plover back, and then, back in the winter woods, shooting ruffed grouse along a trout stream where only an otter fished now, and all the places and the different flights of birds, jumping three mallards now, down where the beavers cut away the cottonwoods, and seeing the drake tower, white-breasted, green-headed, climbing and get above him and splash him in the old Clark's Fork, walking along the bank watching him until he floated onto a pebbly bar.

Then there are sage hens, wild as hawks that time, the biggest grouse of all, getting up out of range, and out of range, until you came around an alfalfa stack and four whirred up one after the other at your feet almost and, later walking home, in your hunting coat they seemed to weigh a ton.

I think they all were made to shoot because if they were not why did they give them that whirr of wings that moves you suddenly more than any love of country? Why did they make them all so good to eat and why did they make the ones with silent flight like wood-cock, snipe, and lesser bustard, better eating than the rest?

Why does the curlew have that voice, and who thought up the plover's call, which takes the place of noise of wings, to give us that catharsis wing shooting has given to men since they stopped flying hawks and took to fowling pieces? I think that they were made to shoot and some of us were made to shoot them and if that is not so well, never say we did not tell you that we liked it.



HISTORY RELIVED

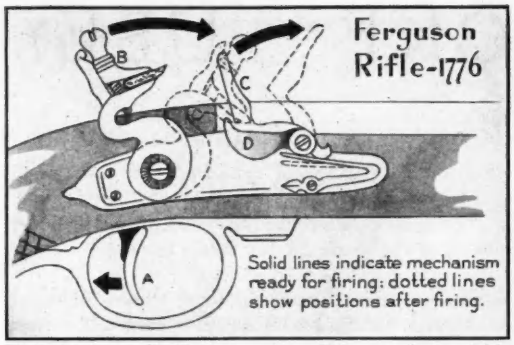
THE BARK OF AN ANCIENT FLINTLOCK RECALLS AN AMERICAN VICTORY OF OUR FIRST GREAT WAR

THE PHOTOGRAPHS on these two pages record an event which probably has not been duplicated in this country since the 7th of October, 1780. On the afternoon of that day Lieutenant-Colonel Patrick Ferguson of His Majesty's colonial forces in America was killed and all of his troops slaughtered or captured by a force of backwoodsmen armed with flintlock "Kentucky" rifles. An important milestone in the War of Independence, the short bloody fight on the slopes of King's Mountain, South Carolina, saw the last recorded use in the New World of a rifle that might have changed the whole course of American history, had it not been decades ahead of its time. Considered the finest rifleman in the whole British Army, Ferguson himself was the inventor of the new weapon, and armed some 150 of his men with it at his own expense. Since that day on King's Mountain, it is doubtful that the sinister crack of a Ferguson rifle had been heard on this side of the Atlantic until these tests were made.

Photographs by John Scofield

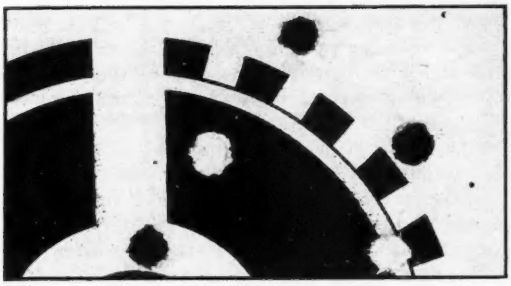
Chances are, fewer than a dozen of Ferguson's breech-loaders survive today. One of them, made for the Britisher by F. Innis of Edinburgh, belongs to the U. S. National Park Service. It is this rifle that John Doerr, Chief of the NPS Naturalist's Division, is shown loading and firing. His costume, of black, red and cream with gold pipings, is a reconstruction from a Park Service museum; the accessories used, bullet pouch, priming and powder flask, are genuine old pieces, borrowed from museum cases for the occasion. On the opposite page are pictures showing how the old rifle was loaded.

After tests were completed, including the first accuracy trial in a century and a half of disuse, the rifle was shipped back to the site of Patrick Ferguson's last disastrous encounter with Yankee sharpshooters, where it will be placed behind glass in the new King's Mountain Museum, to be opened sometime this year. Beside it will be a muzzle-loading American rifle of 1776, placed there to remind U. S. citizens of another war and how we won it.



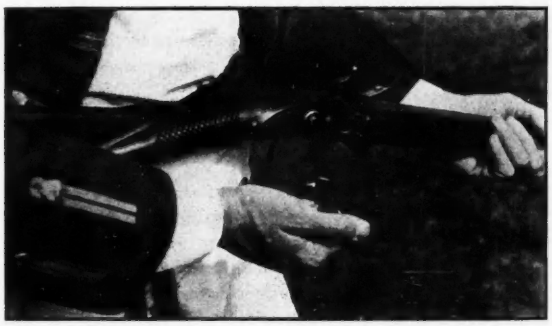
This is how flintlock works. When trigger (A) is pulled, flint in jaws of hammer (B) strikes glancing blow against steel (C). Steel snaps forward and sparks ignite powder in pan (D), which fires main charge through hole into barrel

Five-shot group, fired prone at 25 yards, measures 3⅞-inches. Ferguson once fired 6 shots in minute, claimed better accuracy than this



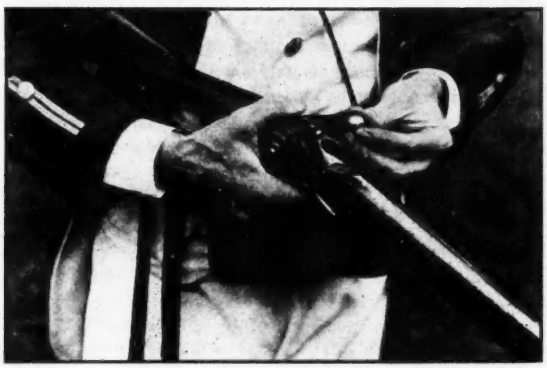
Picture below shows first step in loading Ferguson. Turning trigger-guard one complete revolution withdraws breech screw which extends through the barrel

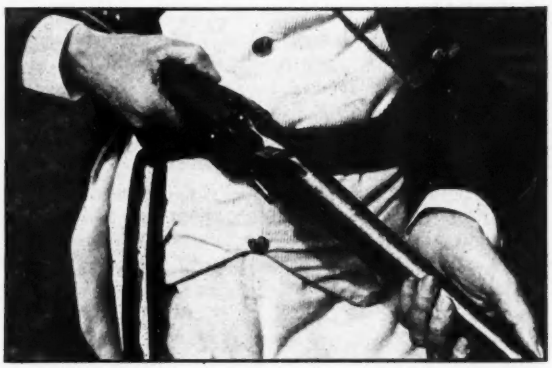
Ball and powder are then dropped into breech through this hole in top of barrel. In using ordinary flintlock, charge was measured and rammed down the muzzle



The lead ball used weighed 424 grains, was nearly ¾-inch in diameter. Behind it went 63 grains of black powder. Recoil was like hard push on shoulder

Breech is closed by reversed turn of trigger-guard. In final loading operations lock is primed, steel closed over pan, hammer cocked before firing rifle



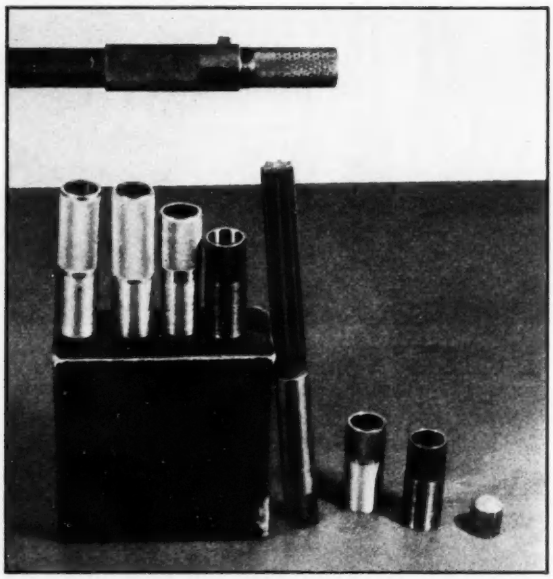


SHOTGUN CHOKE TUBES

By NORMAN POWELL *

I HAD ORIGINALLY PREPARED an article giving considerable data on shotgun choke tubes which I had made and tested for sporting purposes. Now that we are at war, I believe that this data can be made of even greater value, there being in this country a great number of repeating shotguns suitable for conversion into formidable weapons of defense, such conversion also making them into real all-round guns, especially since there are numerous gunsmiths and gun cranks capable of doing this work.

It has been known that while certain guns shoot well with a particular load, a great many will not handle heavy



A handmade choke tube mounted on the author's 16-ga. Ithaca. Below it are additional tubes, adaptors and a tapered reamer used by Powell in boring these tubes

loads capable of stopping a man. The writer having converted his little 6-lb. Model-37 Ithaca to take interchangeable choke tubes (these being screwed into a sleeve by hand until seated on the end of the barrel), has been able to produce the densest of long range patterns with all sizes of shot from 8 to 4. These 16-gauge patterns are denser than most heavy loads in a 12-gauge full choke that was shot at the same time. It is reasonable to suppose that the same type of tube can be made to handle heavy buck shot and rifled slugs. Most important of all, a rifled tube can be made to take slugs which do not have rifled vanes, and I would expect fair accuracy at 150 yards or more.

My converted 16-gauge shoots more like a rifle than a shotgun, keeping the dense center of the load on a target only 10 inches wide at 40 yards, this feature being due to the long bearing of the sleeve on the barrel and the choke tube in the sleeve.

Any cylinder or improved cylinder-bored gun can be converted with or without shortening the barrel. Full choke guns should be opened up to improved cylinder dimensions, or the choke cut off before installing a choke tube.

Old automobile axles make the finest sleeves and good tubes, although S.A.E. 2315 steel, case hardened, is best for tubes, since hard polished steel is more slippery and picks up less lead. Chromium-plated tubes of soft or hard steel are best of all in this respect.

I have found that the following factors produce the densest, hardest-shooting patterns with all loads:

(1) The design of the tube must be suited to the velocity and amount of shot. Since the reduction of a load of shot by the choke takes time, the higher the velocity the longer the taper cone must be.

(2) The smoother and more slippery the wall of the tube, the denser the pattern. I have found that a clean, oiled tube will give patterns 20% closer than a fouled tube.

If the design is right the evenness of the pattern is always controlled by the thickness and stiffness of the tube and the concentricity of the taper bore and straight bore at the muzzle. Should these two be "out" by even a few ten-thousandths of an inch an uneven pattern will be produced. For this reason internal grinding or lapping is better than a reamed bore, unless the latter is lapped round. Only an abrasive like the Norton Company's Velviti Lapowder or Bon Ami powder should be used on soft steel.

The dimensions may be seen by reference to the diagram. In all cases, the threaded end of the sleeve must be concentric with the bore of the gun. For this reason the outer diameter of the barrel which receives the sleeve must be turned concentric with the bore and the end of the sleeve sized to a smooth push-fit on the barrel. Both the bore of the sleeve and the end of the barrel are tinned with half-and-half solder and sweated into each other. Threads should never be cut on thin-walled barrels.

Choke tubes are 3 inches in length for full choke. Open bores are 2 inches long. All degrees of choke in 16 gauge are controlled by one inch of length, the taper of the cone being .013 per inch. The suggested taper for 12 gauge is .016 per inch. Choke diameters from 0.625 to 0.630 are used for trap and high velocity loads. Tubes 2¾ inches long, 0.640 to 0.645 in diameter are best for loads of 2¾ drams and 1 ounce of No. 6 shot. Tubes for rifled slugs should be at least 3 inches long and the bore a few thousandths of an inch larger than the slug.

To do the job, a 43/64 standard reamer can be converted to a taper reamer by grinding to a 0.013 taper. A 47/64 reamer can be made about 0.016 taper per inch for 12 gauge. After the taper hole is reamed, using a taper mandril, the tube is turned, and the threads cut and knurled while on the mandril. I am convinced that thin-walled tubes expand and ultimately make 0.625 full-choke tubes with a wall 0.087 thick. The diameter of the bore at the muzzle of the gun and the choke tube should be the same so that there is no step. In my own

* Chief Instrument Maker, Bryn Mawr College, Pennsylvania.

work, holes were drilled in the tubes to relieve gas pressure. In shooting these, the wads dropped in front of the gun and patterns were good, though no better than with undrilled tubes.

The writer hopes that some gunsmith or gun crank will try making a rifled choke tube to shoot slugs cast without the rifle vanes. F. C. Ness has suggested copying the Paragon rifling and a pitch of 1 turn in 2 or 3 feet. I expect to try to do this, but if some of the boys can beat me to it, so much the better.

I have an idea of how to do the rifling in the lathe, when the tube is bored and reamed.

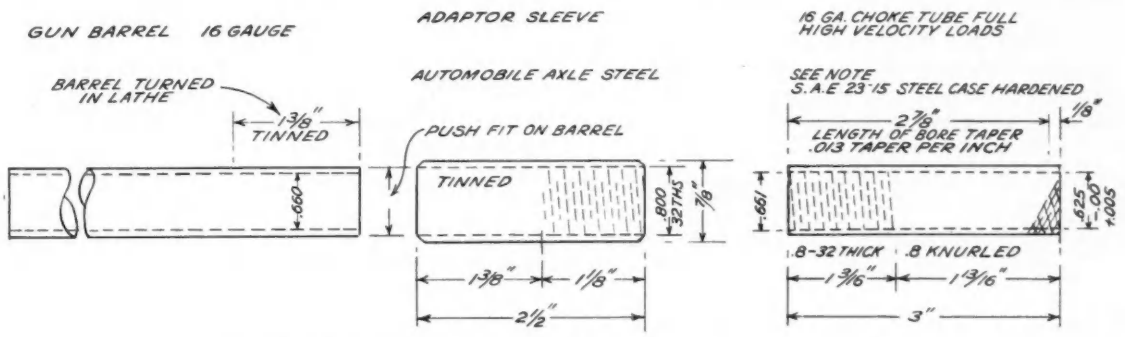
To do this, a piece of steel is centered, a taper turned on one end to fit the tail stock of the lathe and the balance of this piece is then turned to about 9/16 inch for a 16-gauge tube. The dividing head of a milling machine is geared to cut the spiral or pitch, and if eight lands are wanted, eight spiral key-ways are cut on the 9/16-inch diameter, a 3/16-inch square hole having been filed in the 9/16-inch bar to hold the cutter. Another piece of steel is turned, tapered to fit the taper hole in the spindle of the lathe, and a 9/16-inch reamed hole is put clear through it after which it is counter-bored an inch or more deep and about ¾-inch in diameter. The bar mounted in the tail stock is pushed into the hole and then packed with fine clay to stop leakage. Babbitt is poured in, in the same way one pours a lathe nut on the lead screw. Of course, holes are drilled through the walls of the ¾-inch hole to prevent the Babbitt becoming loose in turning.

The reader will see that when the tail stock is turned the cutter will move forward or backward and the spiral key-way engaged in the Babbitted keys will turn the spindle and choke tube. To index for the next groove, the bar is moved back until the key-way and keys are disengaged. Upon making a ⅛ turn of the spindle, they are engaged again. The spiral should be cut in the opposite direction to the thread on the tubes.

After shooting many different loads in different tubes, the writer is convinced that no one design of tube will handle all kind of loads. His experience along this line confirms the data published by F. C. Ness and other arms experts tending to show that different loads gave different patterns in the same gun.

It is true that a compromise tube or choke can be made that will shoot a number of loads fairly well, but in obtaining maximum efficiency with a given load a tube or choke can be made that will shoot a number of other loads fairly well. To illustrate this we can take the case of my 16-gauge Ithaca. The standard diameter of the 16 gauge is about .640 for full choke. Tests showed it not to be enough choke for high velocity and trap loads, these loads requiring a smaller diameter choke (.625 to .630) and a longer tube. On the other hand, the .640 standard choke was found to be just about right for 2¾-dram 1-ounce loads. High velocity loads gave no advantage whatever as to pattern in this standard choke. One hardened and ground steel tube was made in .643 choke diameter by 2¾ inch long, with the expectation of modified patterns. I got them with high velocity loads, but 2¾ drams with 1 ounce of No. 6 shot gave dense full-choke patterns, equalling in hits per square inches 1¼ ounces of 6's in a 12-gauge full-choke gun. All of this proves that the man who buys heavy loads may be fooling himself if the choke is not suited to his loads. There is no doubt in my mind that the 16-gauge gun is underchoked for high velocity and trap loads and that finely made tubes of the right design will give maximum load efficiency. Maximum efficiency patterns are too dense for upland game, but they do prove that few pellets are being deformed in the choke, and since this condition is obtained it is a fairly simple matter to make open pattern tubes.

After making these tubes I read a description of shotgun chokes and it appears that my design is quite different from the standard choke. I use .013 taper per inch against .050 used by others. Also, standard chokes have from 1½ to 2 inches of straight bore, beginning at the small end of the taper and extending to the muzzle. My .625 full-choke tube has only about ⅛ inch of straight bore, yet this design outshoots my full-choke



Details of the Powell choke tube, and the method of securing it to the scatter-gun barrel. All necessary dimensions are included

12 gauge. I would welcome some comments from the experts on this point. I grant my design may be improved on, but I do think the slow taper best as fewer pellets will be deformed.

Mr. Ness of THE RIFLEMAN "Dope Bag" has examined and measured a number of 16-gauge mechanical samples and pattern exhibits which I sent him, and the dope which follows is based on his reactions. The long choke-tube (3-inch) of Alleghany metal is finely threaded for half its length to fit the adapter on my barrel. The remaining half is finely knurled to provide a hand grip for removing and replacing the tube. Its lapped bore measures .663 inch at the threaded end and .628 inch at the muzzle. The smooth-sided round-nose ounce slug has a deep base-cavity and mikes .649 inch in diameter.

Since preparing the material above, I have made two rifled tubes; one with a 30-inch pitch and one with a 24-inch pitch for controlling slugs and ordinary round lead balls. The round-ball samples measured .658 to .665 inch, and those forced through the rifled tube showed its broad and shallow grooves had a total diameter of .6498 inch, Ness' miking. All these dimensions are Dope Bag figures. The first rifled tube had a bore diameter of .640 inch and a groove diameter of .645 inch. The lands were about .057 inch wide and the grooves about .187 inch. I used the tools and methods described in the story above and made this tube 3¼ inches long, as well as a punch and die for forming slugs, which are ⅝ inch long.

In my first tests, the ¾-inch ounce slug tended to keyhole in the 30-inch twist, which tendency was eliminated by the adoption of the lighter ⅝-inch slug which weighed 350 grains. This was loaded in Ranger 16-gauge loads containing 2½ drams bulk smokeless and fired at 50 yards. The best 5-shot group measured 5 inches center-to-center, which is very good shotgun accuracy in the absence of target sights. Round-ball loads performed as well in this rifled tube as rifled slugs do in the smooth bore. Even shot loads of No. 6c gave fairly effective patterns up to 40 yards in spite of the rifling.

Since round balls performed so well in this rifled tube, I equipped the Model-37 Ithaca with target sights and got from Lyman a mold to cast .648-inch lead balls. With factory Super-X single balls, .651-inch diameter, it now shoots squirrel-size groups at 50 yards and 10-inch groups at 100 yards. The best group of five consecutive shots at 100 yards measured 5½ inches, center to center. Also two consecutive 5-shot groups at 50 measured yards were 2 inches or less in extreme spread. These particular .651-inch balls weighed 398 grains. These balls would penetrate 6 inches of pine placed 15 feet from the muzzle. The group measurements above are Mr. Ness' as are the pattern analyses which follow.

Patterns with the rifled tube gave 4.6 hits per 3-inch square at 25 yards with an ounce of No. 6 shot and 5.5 hits with 1⅛ ounces of 8 chilled. At 40 yards 6c's averaged 1.8 hits per 3-inch square in ounce- and 1⅛-ounce loads. Large shot did not do as well, No. 4 chilled running from only 0.50 hits to 0.85 hits per 3-inch square at 40 yards. At 50 yards No. 6 shot duplicated this, with 0.50 hits.

The choke-tube patterns were made with several different tubes, all lapped and polished. The .625-inch tube of Alleghany metal was cleaned and oiled before each shot. At 40 yards, 1⅛ ounces of No. 4 chilled made 3.1 hits per 3-inch square, and 8.0 hits per square with 1⅛ ounces of No. 8 shot. Another hardened steel tube of the same diameter made 1.3 hits with the same load of No. 4 chilled at 55 yards.

A .628-inch hardened steel tube made 2.3 hits per 3-inch square with 1⅛ ounces of No. 5 shot at 50 yards, or a hit per 4.3 square inches of the target area. With No. 4 chilled this tube made nearly 2 hits per 3-inch square at 50 yards. A larger .643-inch hardened tube was tried with an ounce of No. 6 shot and 2¾ drams powder at 40 yards and averaged a hit per 1.4 square inches, or nearly 2 hits per 3-inch square. Another pattern was fired at 40 yards with this same .643-inch tube and the same load of No. 6 shot, giving 120 hits in 18 x 24 inches, or 2.5 hits per 3-inch square.

Under the same conditions and in a great number of guns, Dope Bag tests have averaged 1.8 to 2.05 hits per 3-inch square at 40 yards with No. 6 shot. Records under these conditions range from 1.5 to 2.5 hits per square.

[Should any reader want to translate these patterns in the terms of hits in the standard 30-inch circle at 40 yards he merely needs to multiply the hits per 3-inch square by 78.54, which is the number of such squares in the area of the 30-inch circle. Also, those who wish can find what standard 16-gauge chokes and loads give in the way of patterns by turning to the Dope Bag Department, this issue.—Ed.]

HOW *and* WHY *of Hunting Sights*

(*Continued from page* 10)

as you can miss it up or down. Therefore a good rear sight must have lateral or windage adjustment as well as elevation. The principle of lateral adjustment is just the same as that for elevation. Move the rear sight in the direction in which you wish your shot to strike.

Most minute of angle sights have the windage scales graduated with lines that are four minutes apart, because military sights were originally graduated in this manner, and windage tables are prepared for such graduations. The head of the windage screw is graduated with 4 minutes around it, and also frequently with quarter minute lines. The 4 minute graduations on the scale are often called "points." One point equals 4 inches at 100 yards. An adjustment which the military marksman called a "point and a half" the target marksman would call "6 minutes."

When you get your windage just right, shooting on a day when there is practically no wind blowing which might deflect the bullet sideways, that windage reading is called "zero." The zero on a good rifle is almost always constant and does not usually vary with the distance (at mid-ranges) for all kinds of high power ammunition.

General

With a new rifle the required sight adjustment, both elevation and zero, may change slightly during the firing of the first 20 to 50 rounds while the rifle is pounding itself down to a constant position in its stock. The same change may take place when you take a rifle out of its stock and then assemble it again. After that a good rifle should maintain a quite constant elevation and zero until the bore becomes considerably worn by erosion. Of course different makes and loadings of cartridges may require quite different adjustments of the sights.

Remember that at any given range changes in sight adjustment to make the center of impact and point of aim coincide are purely a matter of angles. Trajectory or the velocity of the cartridge has nothing to do with it. It is only when changing from one distance to another that trajectory or velocity becomes a factor. Here the cartridge with the flatter trajectory will require a smaller angle of elevation between the two distances. A following article will discuss trajectory and estimating distance.

BRITISH LION AT BAY

CONCLUSION

by GARRETT UNDERHILL and J. J. REEN

AMERICANS WILL FIND British artillery confusing because guns like their new 25-pounders and the antitank are organized into what is called a battery (which is our battalion) and then into troops (which are our batteries). They will also be confused when they suddenly appear on the site of a medium howitzer and learn that it is not to be referred to as a 99.4-pounder, but as a 6-inch howitzer. This howitzer is nothing more than a modernization of an obsolete type, utilizing pneumatic tires. Compared to the similar Nazi piece, it is outranged 16,400 to 10,000 yards, though their common mission is to destroy enemy artillery. Like the medium howitzer, the medium British gun is a single or box trail piece, and be careful!—this is to be called not a 4.5 gun but a 60-pounder. There are old, unmodernized 60-pounders that have been used in the desert, and there are now some that have even a split trail and equilibrators to obtain extreme elevation. The normal modernized type of this long-range counter-battery gun is outranged by the German 105-mm gun 19,700 yards to 15,500 yards. Very commendably for all concerned, the British got together with our Ordnance Department and with the last Chief of Field Artillery, General Danford, to agree on a new American-built and American-designed 4.5-inch gun. This is to be the new medium gun for our united democracies. It is greatly superior to any enemy weapon, with its split trail and latest gadgets and industrial design. It is an example of the merging that will probably take place in all of our arms policies before the war reaches its conclusion.

Heavy British field artillery is represented by modernized or unmodernized 6-inch (152-mm) guns and 8-inch howitzers of the last war. These are quite obsolete in any condition, the former having been outshot by the Model 1917 French 155-mm GPF by double the range. Our new 155 M1 outranges it 26,000 yards to 20,000. Enemy weapons do about the same, thus exacting from the British public now in uniform a heavy price for the neglect of its army prior to the war.

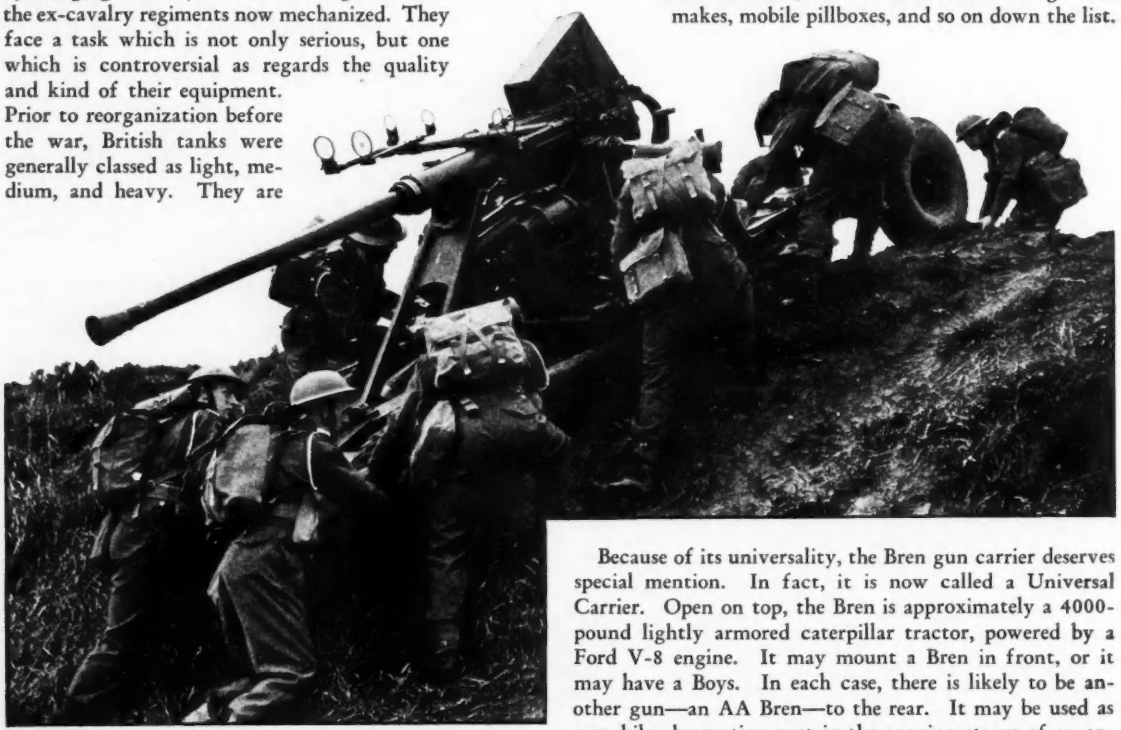
Other and heavier British artillery has generally had to await modernization and replacement until the requirements in more basic categories are fulfilled. On recalling that the Royal Garrison Artillery (which has jurisdiction over the heavy stuff) was lamenting its perilous state even before 1914, one can gain some idea of the miracles that the British Army has worked with its coast defenses to hold against raids as it has held in this war. However, overhead protection has been improvised at a great rate to protect guns and crews from planes. Howitzers have been emplaced, because after the Dardenelles it was realized that the plunging fire of these guns hit attacking warships where they were most vulnerable: on their decks.

The British crew of a fast-firing Breda 20-mm antiaircraft gun follow the flight of a German bomber over the desert

Present British coast guns run from old 12-pounders up through weak 9.2-inch guns to 6-inch guns with a range of 12 miles; 16-inch guns ranging 20 miles; 18-inch pieces and 15-inch hows ranging 13½ and 6¼ miles respectively. With the fall of Singapore went the 18-inch wonders that were the guns built for the cruiser-destroyers *Furious, Courageous,* and *Glorious.* In the last conflict these ships were known as the *Outrageous* class because of their absurd armament of two of these immense cannon.

In actuality, the Royal Garrison Artillery has not too much to worry about, for as long as the RAF and the Royal Navy do their job, there will be little to do along the shore except protect bases.

No such easy task faces the Royal Armored Corps. This outfit now manages the combination of forces made by merging the Royal Armored Regiment and the ex-cavalry regiments now mechanized. They face a task which is not only serious, but one which is controversial as regards the quality and kind of their equipment. Prior to reorganization before the war, British tanks were generally classed as light, medium, and heavy. They are now classed as before—where obsolete models are concerned—but with new names for new types: cruiser tanks, for those fast vehicles of long range and light armor; and infantry tanks ("I" tanks) for those which were designed to waddle along with advancing infantry, eliminating antitank and machine gun nests. What new classifications true armored warfare will bring is uncertain. It is likely that the terms "medium" and "heavy" will be resurrected for tanks, and that the "cruiser" will persist. "I" tanks seem doomed along with the concept that failed to foresee armored divisions. Besides, there is a host of other AFV's (armored fighting vehicles): Bren gun carriers, dingos (scout cars operating mostly with armored infantry), big armored boxes of mobile command posts called "Dorchesters" after the famous London hotel, armored cars of all vintages and makes, mobile pillboxes, and so on down the list.



A Swedish invention, both Britain and the U. S. have standardized the fine Bofors 40-mm antiaircraft gun

Because of its universality, the Bren gun carrier deserves special mention. In fact, it is now called a Universal Carrier. Open on top, the Bren is approximately a 4000-pound lightly armored caterpillar tractor, powered by a Ford V-8 engine. It may mount a Bren in front, or it may have a Boys. In each case, there is likely to be another gun—an AA Bren—to the rear. It may be used as a mobile observation post in the opening stages of an engagement, or it may carry behind its armor essential signalmen and their equipment. In the opinion of many Americans, such a vehicle open to plunging fire and to grenades is a washout. Certainly it lacks the speed of a wheeled tractor. Nevertheless, it has its protagonists here, and certainly in Russia and in France there has been persistence in building armored tractors. It may be said for the French and Russian tractors that they have overhead protection while they are scouting or running up ammunition under fire.

"Smoke pots" on this tank are improvised from cut-down rifles. This one is squadron leader's vehicle

Press Association

The most important British armored vehicle to date is Matilda. She is known, with her weight of 25 tons, as the Heavy Infantry Tank, Mark II. With protected traction gear and very heavy armor, she can take plenty. But she can't dish it out. She has only a 40-mm 2-pounder—a weapon hopelessly out-ranged and out-slugged by the heavy 47-mm, 50-mm and 75-mm shell of the German PzKw III, IV, and tank chaser with Skoda gun. In tank fighting, her co-axial Czech-designed 7.92-mm Besa machine gun can add nothing, of course. This partly gas,

partly recoil operated and air-cooled gun is a recent development, and is now standard tank machine gun armament.

Unfortunately, this policy of the ponderous and weakly armed "I" tank was not only continued but made worse in the production of the Valentine, or Mark III "I" tank. Now being manufactured in England and in Canada, the Valentine has all of Matilda's defects with the addition of the fact that she is lighter (only 16 tons) and therefore has less armor.

This Christie-type Mark IV Cruiser was developed from American designs. It mounts a two-inch gun, carries a crew of four men

Another regrettable circumstance is that both of these tanks had no need of being fast if they were only to accompany infantry in battle. Hence their cross-country cruising speed is about 6 miles per hour, and the best of the two tops no more than 15 on the road. This unsuits them for maneuver in armored warfare, in which German tanks up through the 23-ton PzKw IV hit an average of 23 miles per hour.

Having to do the best with what they had, the British used Matilda in the abortive efforts of Wavell to get Rommel in the spring of 1941. So many of the Matildas were either opened up by the high-velocity German Flak (AA) 88-mm guns or otherwise disposed of, that when Cunningham advanced against Rommel this last winter, the Germans had a respectable number of Matildas to throw against their former owners. Luckily, the Germans have a predilection for working out against tanks with their long-range storm-shielded Flak 88's. When those heavy-fisted guns hit, often there is little left for salvage. This year Matilda has gone in again and heroically taken her losses. Accompanying infantry, she helped to clean out the fortified Axis positions around the Omars, and in Halfaya Pass and at Sollum. These places were infested with Flak 88's. And like all other British tanks, Matilda's under-gunned condition made her suffer heavily whenever she came against other tanks.

The failure to appreciate in full the value of the gun in armored warfare is also reflected in the cruiser tanks. These are the maneuvering vehicles that can make long rapid sweeps. Ex-cavalry regiments like the Hussars man them. So far, cruiser tanks tend to have the big bogie wheels that are associated with the speedy track suspension invented by our compatriot Christie. A typical cruiser widely used in the campaign that broke the Italians in 1940-41 is the Mark IV, a 14-tonner that can hit 40 miles per hour on the road, 25 cross-country, and cruise 150 miles. With the same armament as Matilda, this and later cruisers, the Mark V Covenanter and the Mark VI Crusader, a 20-tonner used in the desert this last campaign—have speed and maneuverability, but not much armor and certainly no punch in their 2-pounders.

Test-firing one of Britain's ponderous 12-inch howitzers

Against criticism of this sort, the British can justly say that they have kept the silhouette of their tanks well

down while we were building pyramids and rolling tenements. They realized the necessity for avoiding open slits, and for fitting periscopes and like indirect vision gear. At an early date they fitted fine self-shifting transmission for Matilda, eliminating hand shifting on a vehicle which—unlike a car—loses headway the instant you cease acceleration. Finally, if they missed the point of guns and still bigger guns, they were installing at least a 2-pounder cannon and building weighty tanks while we were fiddling with 37's in 18-tonners and with 12-ton lights armed with machine guns.

Now they have new lights—the 13-ton M3—which they call medium and a cruiser; and the 28-ton Chrysler medium, which they call a heavy. British proper names for them are respectively General Stuart and General Lee. These tanks of course retain our armament—the Brownings and the 37's, as well as the big 75's for the General Lees.

The 6-inch or medium howitzer is outranged 16,400 to 10,000 yards by similar Nazi gun. Its mission is to destroy enemy artillery

British armored warfare is bound to include more RAF action in the future. Spitfires are now fitted with two, and Hurricanes with 4 Hispano 20-mm aircraft cannon.

Spotter attached to an AA battery

First appearing in the late summer of 1940 so far as official notice goes, the Hispano-Suiza was adopted by Britain (before the US) as a belated recognition of the necessity of something that would do more harm to armored German aircraft than the eight .303 caliber air-cooled Brownings till then carried in RAF fighters. With very little change, and a fire rate of 600 rounds per minute the Hispano is identical with that used in the French Moranes that gunned German tanks in the spring of 1940, the Rheinmetalls that Messerschmitts used in Spain in 1937 and thereafter, and the Hispanos used in our Air Forces today. All are derivations of the Swiss Oerlikon automatic cannon. And all will force tanks to encumber themselves with additional armor in their now thinly protected topsides. Such a move will be necessary, though the armor piercing, explosive and tracer combination used against other planes is unsuited for tank attack.

Whether these cannon will entirely replace the rifle-caliber machine guns of the famous 8-gun fighters is an unsettled point, but at any rate nothing can detract from the praise that must go to the RAF for first recognizing the need for heavy gun armament. In the air they were much further in the lead than the Germans were on the ground in recognizing the importance of the gun. And not only did the RAF discover the importance of the gun in the air, Britain was perfectly willing to go to Colt's for the best heavy aircraft machine gun, when Vickers could build none to match that developed by Colt and the US Army Ordnance Department.

This record is somewhat spoiled by the effort made to get a light, short machine gun for use by observers and others requiring flexible guns in planes. Brownings could be used in the big tail turrets of Whitleys and Wellingtons, but in the narrow cockpits of Battles or Hampdens something smaller was in order—or so it was thought. Towards this end, Vickers developed and sold beginning in the late '30's their gas-operated "K" gun, which is pan-fed like the Lewis. Normal pans hold 100 rounds, and are fired off at a rate from 1000 to 1200 revolutions per minute. After the first raids into Heligoland by Hampdens, the "K's" were reported as firing too slowly compared to the 1200 rounds per minute Brownings forming the more successful defensive armament of the Wellingtons. The "K's" were speeded up, and paired. Lately it has been interesting to notice that the Blenheim bombers—which once had a single "K" in their rear turret—

have gone over to a pair of specially short, recoil-operated Brownings.

Perfectly willing to take the other fellow's weapon if it proves better, England jumped the Bofors bandwagon in taking the famous 40-mm antiaircraft. Though some aircraft Hispanos have in the past few years mounted AA guard on British airdromes, the low-flying defense par excellence has been the Bofors. Taken in 1938 after many other nations had swarmed to the Swedish Model 1936 following its success in Spain, the British version was—as usual—a long time going into production. It was among the guns missing at the time of Munich. Now, it has distinguished itself in every corner of the globe, wherever British forces have made their stand. Firing super-sensitive, self-destroying 2-pound shells (they burst before they fall if they do not hit first) at the rate of 120 to 130 per minute, the Bofors can keep off dive bombers and any attack or level bombers that venture to 7000 feet or below.

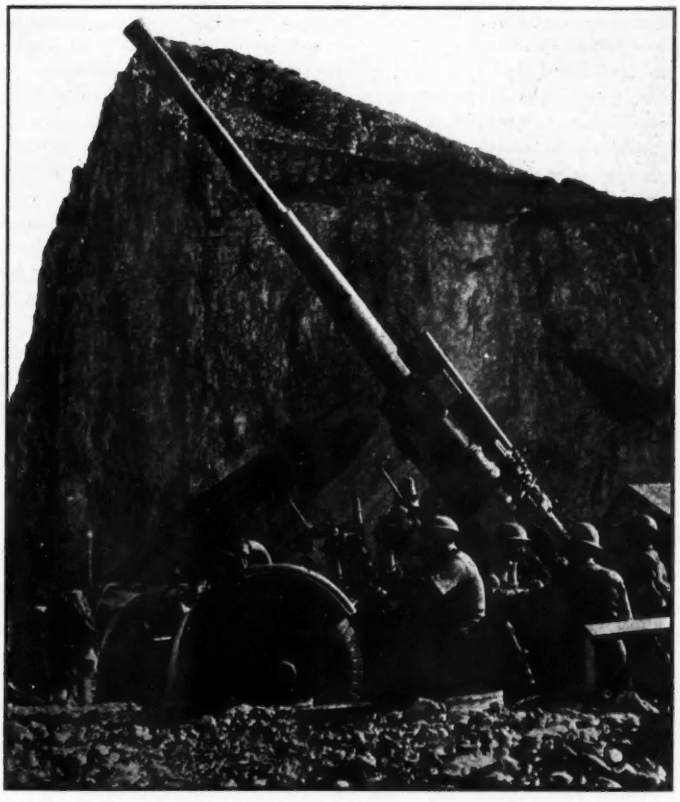
About the same time that the Bofors was on order—late in 1937 to be exact—the new British heavy AA gun was adopted for production. Feeling that the old marks of 3-inch guns with their effective range of 15,000 feet could no longer secure the British Empire, the Royal Artillery wisely went up to a 94-mm, or 3.7-inch. This formidable weapon can get off 12 28-pound shells a minute to 30,000 and even 36,000 feet. Like so many British weapons, it, too, has been a production headache. In the early stages, it was announced that it was taking three months to turn each gun from Woolwich or from the special AA factory at Nottingham. As completed, the gun appears as British as beefsteak; quite heavy, and solid looking. While up to or ahead of the game in caliber, it is nevertheless not adaptable for quick use as an anti-tank or ground assault gun, as is the Russian 76.3-mm and the shielded German Flak 88's. A later version is actually immobile so that it can be fitted with heavy armor protection against bombing and strafing from attacking enemy aircraft.

A companion piece with even greater recognition of the principle of shaking 'em up in the air with big HE shell is the 4.5-inch gun. A naval type with full armor, the 4.5 lifts a great 50-pound shell the same height as the 3.7's shell 10 times a minute. The explosion is terrific.

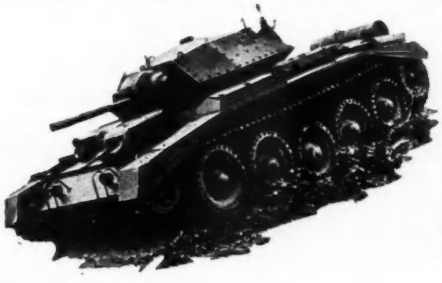
As the example of antiaircraft equipment shows, again and again the British have been right on the ball. Their record may not be perfect, but it is good. We, who sometimes accuse the British of being super-selfish and scheming imperialists, should note the number of times well before the war that the British have humbly come to take American inventions from American manufacturers. In so doing the British have displayed an open-mindedness that many Americans could not match.

If the spirit of understanding in the field of arms were further developed, and differences that are merely cultural eliminated for designs that are most efficient for the universal denominator, the mutual cooperation of the two great democracies would be immensely aided, not only along practical lines, but along those of good will. The armies would come to understand each other more quickly, as would war workers. In an atmosphere of understanding, they would be better able to bring about that union of nations which must be the cornerstone of future security.

One way to sow the seeds of such an understanding is for interested Americans to accord British arms the standing that their merits and their deeds deserve.



Outlined against "the Rock," this 3.7-inch antiaircraft gun plays a vital role in the defense of the Gibraltar fortress



Press Association

One of Britain's new 20-ton tanks, the speedy "Crusader"

MINUTE MAN, 1942

TO WIN THIS WAR the largest and most highly trained army and navy ever developed in our history must be used for offensives outside the continental United States. Every highly trained soldier who has to be kept within the United States to guard munitions plants, power dams, railways and other installations is a loss to our offensive striking power. Nevertheless, it must be recognized that there are thousands of miles of American coast line and hundreds of thousands of acres of American territory so sparsely settled that the landing of sea borne or air borne raiding parties or the organization and training of raiding parties within our borders is entirely feasible. But men who by reason of age or physical disabilities are not suitable for use at the fighting front can be utilized for guard duty at home. These same men, however, are needed to work at the job of supplying food and munitions to the fighting men at the front.

It is a serious blow to the war effort to enroll these workers in guard organizations and then to call them away from their employment to permanently guard every installation in this country which might be attacked by saboteurs or raiding. Therefore, the revival of the ancient conception of the citizen soldier, what we in America have called the "Militiaman" and the "Minute Man", is the only feasible answer to this enormous problem. Armed with weapons with which he is thoroughly familiar from long use, operating in a community in which he knows every road, trail and stream, and aroused to fighting pitch by the knowledge he is fighting to protect his home, the Minute Man, *if properly organized and trained*, will prove a thorn in the side of enemy raiders.

The Minute Man's familiarity with the faces, customs and habits of his neighbors in the community also makes him valuable in combatting sabotage attempts. He will notice strange faces or unusual activities on the part of local inhabitants much more quickly than a Secret Service operative from the outside.

With these facts in mind, we present this bulletin suggesting an organization plan for "Reserve Militia" organizations which may, with equal propriety, be termed "Home Guard" or "Minute Men."

1. Mission: The mission of Reserve Militia ("Minute Men") Units is to furnish *immediate local protection* again saboteurs and organized raiding parties, destroying them or serving as a holding force pending the arrival of better equipped and better trained troops. Their function is that of armed combat. Their field of action lies in the suburban and rural districts. Their duties are entirely different from those of the Auxiliary Police organized in cities by the O. C. D.

"Minute Men" supplement and do not conflict with State Guard functions. The mobilization of a State Guard Unit and its transportation to a threatened area will require from one hour to several hours, depending on the size of the force and the location of Guard Armories with reference to the scene of action. If properly organized and trained, the Reserve Militia or "Minute Men" will be able to bring continuing observation and fire to bear on raiders within twelve to twenty minutes after the initial alarm. This will usually mean that the raiders are brought under fire before they can completely organize at their assembly point. Thus the "Minute Men" supplement the State Guard by (a) furnishing invaluable information as to the location, strength and apparent object of the raiding party, and (b) by delaying the organization of the attack during precious minutes that the State Guard is mobilizing and moving up to the scene of action.

2. Equipment: The men furnish their own arms, ammunition and transportation. Distinctive arm bands and caps are essential and a complete, inexpensive uniform is desirable. "Coveralls" of the type that are belted at the waist and have strap fasteners at the wrist and bottom of the pants leg make very good uniforms. Color should be khaki or a shade of green or gray that will provide maximum camouflage in the country in which the Unit will operate. Uniform items may be furnished by the State, County or by the militiamen. Articles of uniform, however paid for, must be of uniform design throughout the State (preferably throughout Corps Area) to insure ready identification so as to avoid clashes between friendly parties. Some "Minute Men" will own shotguns and some will own rifles. Such variations in types of arms will govern assignment of men to units so that shotgun units and rifle units may be efficiently utilized in the tactical employment of the troops.

3. Personnel: Officers and men will be drawn from the immediate area in which they are to serve. As far as possible, existing shooting organizations (rifle clubs, trapshooting clubs, skeet clubs, fish and game clubs, etc.) will be mustered into the Reserve Militia as complete County or Sector Commands under their own officers. Members of such organizations, particularly civilian rifle clubs, are already accustomed to semi-military discipline in addition to being much better trained in the safe use of firearms in group activities than is the average casual hunter. The types of arms available will also be better standardized in these organized groups.

Men not physically fit for field service in the Army will, in a majority of cases, be entirely suitable for Reserve Militia service. Marches are short and the period of continuous action limited. The familiarity of the militiaman with the terrain and road net in his community and the extent of his personal courage are more important than his ability to stand the physical strains of soldiering in a field army.

In some localities where Reserve Militia units are obviously needed, no sportsmen's club may exist. In such cases, independent shooters must be recruited. No general recruiting campaign should be carried on until the State has been surveyed, the desirable locations for units determined, and the available sportsmen's organizations utilized. To be worth their salt, the "Minute Men" must be carefully selected, carefully organized and carefully trained. Wide-spread recruiting on a wave of publicity and popular enthusiasm will result in the enrollment of men with a variety of equipment, mixture of personalities and diversity of backgrounds which will greatly complicate the problem of developing an efficient, dependable military force.

In the formation of Local Units the occupations and working hours of the men must be carefully considered.

Units should be composed of men who work approximately the same hours. Garage or boatyard owners or foremen with three or four of their workmen may be formed into a Unit which will always be together at work, will be at home at the same hour, and will be able to leave their jobs all together in one car at a moment's notice. The owner or manager and three or four clerks from a store, bank or printing establishment will be similarly well situated to function as a Unit.

When men are employed on two- or three-shift operations the men in one Unit should all be employed on the same shift. In such cases the effort should be made to organize two or three Units for each Unit Area instead of the more conventional single Unit. There would be a permanent Sector Commander but he would have under his direction two or three complete "shifts" of Units.

All men enrolled must be well and favorably known in their community. Fingerprinting is desirable, both for a check-up on personal backgrounds and for possible future identification purposes. No person whose previous affiliations, associations or activities have indicated that he may be an enemy of *American institutions* must be enrolled.

4. Organization: Maximum effectiveness would be attained by organizing the Reserve Militia Units under a uniform plan throughout the Nation. Certainly, if at all possible, the plan should be made uniform throughout a Corps Area. Where such organization is not immediately practical, good results can be expected from a State-wide organization. Where State-wide organization is not feasible, organization on a County basis will afford improved security within that County. Cooperation and coordination between adjoining counties will further improve the security of all participating.

The very essence of the "Minute Man" type of Reserve Militia organization is the ability to assemble at a threatened point within a few minutes after the initial alarm. Every phase of the organization plan is aimed at this essential result. It is for this reason that the basic unit consists of four or not more than five men—one automobile load. The Unit Leader has no more than four men to call with a simple previously arranged order ("Enemy Raid—Report at Once!") and the Unit is on its way to the assembly point.

It is for the same reason that a Sector Command is established for each danger point. No Sector embraces more than one danger point. If a danger point is large enough to require more than 25 to 30 men for its defense it will be divided into two or more Sectors. (A short railroad tunnel will constitute one Sector Command while a long tunnel will be covered by a separate Sector Command for each exit. A small airport may be protected by one Sector Command but a large airport may require one Sector Command for the northeast quadrant, another for the northwest quadrant and two others for the southern half of the field—a total of four Sector Commands. In all such cases one of the Sector Commanders is designated the senior so as to insure proper coordination.) This is done so that no Sector Commander will have to call more than six Unit Commanders in order to spread the alarm. Speed of warning and assembly must not be sacrificed for any other consideration.

(a) *State Headquarters:* State Headquarters, Reserve Militia, should be established in The Adjutant General's Office. The organization and operation of Reserve Militia Units is *not* a function of the Office of Civilian Defense as the O. C. D. considers its duties to be entirely "passive defense", i.e. warning and rescue service.

(b) *County Headquarters:* The Sheriff's Office at the County Seat will probably be the best Command Post for each County. Everyone knows where it is located, it has 24-hour telephone service, and it is tied in to the aircraft warning network.

Certain special units may be attached to the County Commander's C. P. if desirable and available. In a County where most of the Reserve Militia possesses shotguns and only a few high-powered riflemen are available these riflemen may be used as a Special Weapons Unit. Men especially trained to use hand or rifle grenades (if procurable) would be invaluable as a Special Weapons Unit. The Special Weapons Unit may consist of a carload of men especially trained to use sub-machine guns—they would probably be regular Deputy Sheriffs. If an experienced crew of dynamite handlers are available they may be established as a Demolition Unit. An Ambulance Unit built around a station-wagon ambulance or converted light truck capable *of operating off the main highways* may prove to be valuable.

(c) *Sector Headquarters:* The number of Sector Headquarters in each County will depend on (a) the size of the County; (b) the number of important defense areas; and (c) the accessibility of such areas. Sector Commanders will be appointed by the County Commander with the approval of the State Commander. Sector Command Posts will be located at points (a) having 24-hour telephone service; (b) where ample parking space is readily available for militiamen's automobiles; (c) as close to the center of the road net of the Sector as possible; and (d) preferably where there is room to assemble under cover all members of the Sector command.

(d) *Local Unit Headquarters:* The number of Local Units in each Sector will depend on the mission assigned to that Sector Command. Unit Commanders will be appointed by the Sector Commander with the approval of the County Commander. In no case will there be less than three or more than six Local Units in each Sector.

5. Communications: Communication between State Headquarters and cooperating military and naval services will utilize such telephone, telegraph and radio facilities as may be worked out by the authorities concerned. Two channels of communication should be established because it may be expected that the enemy will attempt to disrupt communications immediately prior to the actual attack.

6. Alarms: The Communications Officer at State and County Headquarters must maintain perfect liaison with the aircraft warning services. In coastal areas, similar liaison should be maintained with the proper naval authorities in order to be prepared for landing parties from enemy submarine or surface raiders.

7. Assemblies: When Units are called out by orders from higher command they will assemble at Sector C. P.'s *and remain there until ordered to move* to designated points, or until dismissed *by the County Commander.*

An action once entered is never broken off until the enemy has been exterminated or has been disarmed and secured. Orders to break off an action under any other circumstances will be disregarded unless delivered in person by the County Commander or a higher authority or in writing over the signature of the authorized officer. Fake orders are commonplace in warfare and must be guarded

against. Units may find it advisable to retire but contact, once established, must be maintained—this is the Minute Man's reason for being.

8. Operations Plan: Conferences between United States military and naval authorities and State Guard and Minute Man officials will be held to evolve an operations plan for the area. Careful surveys will be made to determine (a) the relative importance of various areas and installations subject to sabotage and raids; (b) the availability of military, naval and State Guard forces; (c) the number and location of Reserve Militia (Minute Man) Units necessary to quickly cope with raiding parties or other incidents and to act as a holding force until proper reinforcements can be brought up; (d) the quality and type of communications available; (e) the quality and coverage of the road network.

9. Discipline: Discipline of the type exemplified by close-order drill is not required in Reserve Militia training, but the discipline of close attention and immediate obedience to orders; of sobriety, of self-sacrifice must be impartially insisted upon. Officers and men must be willing to cooperate and to devote time and hard work to their training. This is no social affair. This is WAR—and if the Minute Man is called into action men will die. *Who* will die will depend in no small degree on the quality of training, the discipline and the team-play of each Sector Command. An enemy raiding party or saboteur has no respect for an opponent's social background, political position, or personal opinions—such things must therefore be completely eliminated from the organization, training and discipline of the Reserve Militia *from top to bottom.*

10. Training: As far as practicable, training will be placed in the hands of men having some previous background of military service plus such officers and non-commissioned officers as may be temporarily assigned from nearby Army or Marine Corps posts or from Corps Area Headquarters.

The American "Minute Man" will not be a guerrilla fighter in the sense that applies to the Chinese, Russian, Yugoslav and other irregulars in enemy occupied territory. He will not need to take the continuing risks or to learn the variety of techniques required of the real guerrilla. On the other hand the "Minute Man," by reason of his limited numbers and equipment, must learn some of the tricks of guerrilla warfare—rapid and sure communication; swift assembly; intimate knowledge of every foot of the countryside in his Sector, including its normal sounds and smells; stalking and scouting; the preparation and avoidance of ambushes; and all those obstructions, diversions and harassments that dissipate the enemy's strength, slow his progress and gain time for State Guard and Regular Troops to come up and annihilate the invading party.

The training program will be devoted primarily to (1) Basic Field Training, and (2) Basic Small Arms Instruction. The program will include:

(1) *Basic Field Training*—

(a) Study of terrain from the military viewpoint—selection of fields of fire; defilades; use of natural cover; range estimation; survey of most likely landing and assembly points for raiders and probable routes of approach to objectives; points for ambush, etc.

(b) Stalking and Scouting—personal camouflage; methods of approach without exposure or noise; methods of noting approach of unseen persons; finding locations by map, sun, stars, etc.; developing powers of observation and noting of landmarks for future guidance; maintaining contact and communications at night, etc.

(c) Map reading and sketching.

(d) Preparation of fox holes and slit trenches.

(e) Construction of road and landing field blocks.

(f) Establishment and maintenance of communications—practice in the giving of clear directions written or telephoned so as to enable others to quickly arrive at designated points.

(g) Field First Aid—Bleeding, fractures, sprains, drowning, electric shock, snake bite. It is more important that men learn to take care of their own injuries than for them to learn the usual type of first aid to help others. Unfortunately, no one will have time to look after someone else until a fight has been finished.

(h) Practice assemblies in daylight and dark—selection of quickest approach routes to points most likely to become danger areas.

(2) *Basic Small Arms Instruction*—

(a) Examination of all weapons as to working order.

(b) Safety Instruction—loading and unloading; handling of arms in automobiles and while entering and leaving cars; carrying of firearms on the march; extreme range and penetrating powers of various cartridges; spread of pattern of shotguns at varying ranges; certainty in identifying target.

(c) Effective firing positions.

(d) Sighting-in of arms at effective combat ranges.

(e) Special instruction in sighting and aiming; trigger squeeze; firing positions; rapid fire technique, etc., for men who need such instruction.

(f) Fire discipline and control.

NO OFFICER OR MAN WILL BE PERMITTED TO CARRY A GUN ON MILITIA DUTY UNTIL HE HAS SATISFIED THE COUNTY COMMANDER, OR COUNTY SMALL ARMS INSTRUCTOR THAT HE IS QUALIFIED TO HANDLE HIS WEAPON SAFELY AND EFFICIENTLY!

• *The above is taken from a new booklet, "Practical Home Guard Organization" for Reserve Militia or "Minute Men", prepared by the National Rifle Association as another in its series of civilian defense topics. Copies have been sent the Governors of the States as a recommended plan of action and best means of utilizing the rifle clubs, the hunters, the marksmen of every state and county. The fifteen page booklet is condensed and published here to reach the greatest number of people possible with its outline of organization, operation and probable mission as the NRA officially views the "Minute Men". It may be obtained from the National Rifle Association, 1600 Rhode Island Ave., Washington, D. C. 25¢ a copy.*

TELESCOPTICS

By GEORGE R. PARIZEK *

UNDERSTANDING WHAT IS INSIDE YOUR SCOPE, AND HOW IT WORKS, IS ONE WAY TO APPRECIATE ITS POINTS—GOOD AND BAD

CONSIDERING THE NATURE OF JOHNNIE PUBLIC in peace time, a foregone conclusion is that many technical articles are doomed to certain failure. However, with the conditions that now exist because of the current fracas, it is becoming necessary that serious attention be given to many things and in some cases it even seems to be downright fashionable to start thinking a little. Such being the case, this article on sighting telescopes is an effort to open a line of reasoning on a not too well-known subject.

Previous articles on telescopes have appeared in THE RIFLEMAN in an effort to present a fair evaluation of their qualities and use. Other similar publications have appeared, all commendable in their simplicity, yet it seems that through simplification some information may have been lost. In some cases, additional material might have considerably enhanced the discussion. It is the intent here to gather together pertinent information and to present a generalized discussion of the telescope so that certain qualities might take on a clearer meaning.

Before approaching the subject more closely, it seems wise to point out that this is not a technical article alone. The article may be used for actual reading material and the formulae disregarded with little loss of content. Without digressing further, the unsuspecting reader is now confronted with some aspects of the sighting telescope.

Preliminary—In order to understand the operation of a telescope, certain qualities must be taken as truths. They are:

1. Any point on any other object radiates light in all directions.
2. Any light passing through material of constant density travels in a straight line.
3. Optical paths are according to laws of nature regardless of statements to the contrary. These laws cannot be changed by man.
4. So-called improvements in optical science are but man-made improvements upon his own efforts.

With the above in mind it should be clear how a general consideration can be applied to any sort of telescope.

General—The value of a magnifying optical system is brought about by a quirk of human make-up which causes sight reaction to give an impression of distance rather than size. This is probably due to the fact that our eyes act as an automatic range finder and constant usage has formed a habit of always judging distance. For example, without conscious effort one can compare objects as to their distance. However, to estimate the size of an object, regardless of distance, requires concentration. Actually, if the angle between the eye and the ends of the object is large the effect recorded is nearness; if the angle is small the impression is of greater distance. The first impression of a view through the telescope, due probably to habit, is of shortened distance—the thought of size is a secondary reaction.

From the foregoing statement, it is seen that to cause a far object to appear near it would only be necessary to change the angle at which the eye can see it. Simply stated, such is the function of any telescope. Referring to Figure 1, we note a field of view and a system of lenses interposed between it and the eye at point E. Without attempting to explain the mechanics of image construction, it is evident that angle A is the angle between the front lens and the field and angle B is the angle made by the image and the eye. The number of times angle B is larger than A is a measure of the instrument ability to cause objects to appear nearer.

By reference to Figure 1, the means by which magnification is accomplished can readily be shown. Remembering that light travels in a straight line and that the lenses used in telescope construction are not complex, the performance of a telescope can be demonstrated by examining the light from the outermost edges of the field and its path through the instrument. For illustration, the field of view, the points T, B and the lines shown serve this purpose. Although an infinite number of rays of light emanate from points T and B, we need only to consider three rays from each point to obtain the performance. If the center ray of light T_c, the uppermost ray T_t and the lowermost ray T_b are drawn completely through the telescope, the full performance

* Engineer, State University of Iowa.

of the edge of field point T can be determined. Similarly, point B and the rays emanating therefrom can be constructed through the telescope as shown. This construction forms images I_1 and I_2 which are true pictures of the field of view.

Image I_1 is inverted and since it is inconvenient to observe the inverted image, as in the ground glass of a camera, lens L_2 is inserted with characteristics such as to accept light from image I_1 and to form another image of the field at I_2. Inasmuch as the objective lens inverts the field, lens L_2 performs the same duty again to bring it right side up. Lens L_3 is inserted as a glass eye whose sole purpose is to look at image I_2. It can be seen that the angle made between T_e and B_e is the angle made by the field of view and the center of the objective lens. Angle B, at the eye end, shows the angle made with the eye by the rays from the image formed in the telescope. In addition to magnification, the paths of the rays from T and B show clearly the widths utilized within the telescope and serve to explain all functions.

The construction of a telescope is such that it is impossible to look through the instrument. Lenses L_1 and L_2 are really auxiliary long focus eyes which form a picture at I_2. Lens L_3 is another auxiliary eye that looks at image I_2 only. The eye, when used with a telescope, acts only as a receiver for the light rays which have been gathered together by the glass eyes. The eye does not look at the actual field but rather at its reproduction I_2, thus making easy the angular change which causes magnification. Using Figure I for illustration, the pertinent qualities of optical instruments can be estimated which are described as follows:

Entrance Pupil and Exit Pupil—The entrance pupil of any telescope is the clear objective diameter or that clear diameter as restricted by diaphragms. The exit pupil, so marked on Figure 1, is a picture of the objective as seen from the ocular end. An unrestricted entrance pupil is capable of being measured directly on the surface of the lens L_1. An accepted means of measuring the exit pupil, as described previously in THE RIFLEMAN, is to shade the ocular end, direct a bright light through the objective and then cause the very smallest image back of the ocular to appear on a ground glass. This smallest image is the exit pupil and is a circular point of light that will be located at E, and can be measured.

Magnification—Having obtained the entrance and exit pupil the magnification of the instrument becomes $\frac{\text{entrance pupil}}{\text{exit pupil}}$, *if no diaphragms are used to restrict the objective diameter.* If diaphragms are present, magnification can be determined by use of angle B and angle A. By actual set-up the natural tangent function of angle A can be determined from the formula:

$$\text{natural tangent}\frac{\text{angle A}}{2} = \frac{\text{½ width of field}}{\text{distance objective to field}}$$

Since the exit pupil has already been obtained and by doing so the eye relief approximated, angle B can be determined by the formula

$$\text{natural tangent of}\frac{\text{angle B}}{2} = \frac{\text{½ clear ocular diameter} - \text{½ exit pupil}}{\text{eye relief}}$$

Clear diameter means diameter through which light can be seen. By determining the actual angle corresponding to the tangents, the magnification becomes

$$\frac{\text{½ actual angle B}}{\text{½ actual angle A}}$$

Field of View—The field of view is, of course, the width of object that can be viewed, and is proportional to angle A. Inasmuch as the field is actually that width seen by the eye, it is evident that it should be capable of being calculated from the eye piece end. Keeping in mind the fact that only edge of field rays are shown and that any one of the rays depicts the original point, it is seen that the field fills the clear diameter of the ocular. Since the eye point makes a definite angle with the clear diameter of the ocular, certain conclusions can be reached. If the eye relief, the clear diameter of the ocular L_3, and the magnification of the instrument are determined, the field of view can be calculated. A formula for this can be arrived at as follows: If Figure 1 is referred to and angle F at the eye end is noted we have:

$$\text{natural tangent}\frac{\text{angle F}}{2} = \frac{\text{½ clear ocular diameter}}{\text{eye relief}}$$

From this the whole actual angle F may be obtained which should be divided by the actual magnification. The angle so determined will be the angle of the apparent field. If the apparent field angle is then divided by two and its natural tangent found, the true field of view at any distance becomes [(2) (natural tangent of half the apparent field angle) (distance objective to field)].

It becomes evident from the above that long eye relief, high magnification or small ocular diameter means a small field. Conversely, a large ocular, short eye relief and low magnification allow for a large field.

Diaphragms have no effect whatsoever on the field. A pin hole at the center of the objective, to restrict all light except rays T_e and B_e, would still allow the full field to be visible. Any diaphragms would produce the same effect and would only serve to reduce the illumination reaching the eye.

Eye Relief—Previous reference to eye relief has been theoretical. Actually, the eye relief is the eye distance behind the telescope. Since the average telescope has an exit pupil greater than 2 mm. (the average daytime seeing diameter of the eye), it becomes evident that some variation of the eye point is possible. Referring to Figure 1, it is seen that all exit pupils cross at E. Since each exit pupil represents the rays of light from any one point, it is evident that the point may be seen at the intersections both ahead and behind E. This is the explanation of a variable eye position. Actually, the eye may be at almost any point behind the ocular, however, the field will be reduced in all such cases. Using the telescope, with the eye between E and the ocular, will cause some increase in magnification which may be convenient if only a center point is being observed.

Large relief, large exit pupil and a small ocular will make angle B small, allowing a non-critical eye position. Large oculars, small exit pupil and short eye relief will make the eye point more critical.

Illumination—It is accepted that the diameter of the exit pupil in mm. squared, should be used to represent

the illumination of an instrument. Thus a 5 mm. exit pupil gives an illumination of 25. Since the eye sees only a reduced picture of the objective lens, it follows that the illumination of an instrument should be $\left[\frac{\text{clear objective diameter}}{\text{magnification}}\right]2$. This is true only under the condition that no diaphragms restrict the light after passing through the objective. If diaphragms are present, they may be placed so as to limit the objective diameter. The above test will disclose the fact.

Should such diaphragms be used, the illumination at the edge of the field will be diminished, since light rays T_t and B_b are restricted after passing through lens L_1. Such diaphragms are poorly placed. Proper diaphragms will not affect the light. These may be placed at any point and will serve to prevent spurious rays from entering the eye.

An unshaded objective lens will accept rays outside of the desired field, and these should be removed for clarity of image. An objective shade as shown will serve nicely; so will the diaphragm shown. A proper shade will perform best since rays from outside the field are prevented from entering the telescope and illuminating its interior.

As to actual illumination ratings, we see that large objective and low magnification will cause a large rating, while small objectives and high magnification will lower the rating. Just what the rating should be seems to be an argument. It is useless, however, from an illumination standpoint, to have the exit pupil greater than the entrance pupil of the eye. Man's eyes vary from 1.5 mm. in bright light to 7 mm. at night. A cat's eyes will reach 9 mm. at night and some telescopes pass this amount of light even though no self-respecting cat has been known to use a telescope for night hunting. Five mm. seems to be accepted for ease of use in day time. The fortunate individual with "cat eyes" should be able to use the 9 mm. instrument easily at night with no apparent loss of light if the lenses are clean and of good quality. A large rating is of course valuable if a non-critical eye relief is required, since then it is only necessary that the eye be placed in the vicinity of the exit pupil.

Focus and Parallax—The primary purpose of lenses L_1 and L_2 is to form the picture I_2. Since the objective must accept light from objects varying greatly in distance, it has by far the most important and critical job to perform. Lens L_1 must accept this distance variation and still form image I_1 on a perfect plane depicting as much of the depth as possible. This accomplishment is not exactly possible with all lenses. Photographic lenses perform the work most efficiently, cheap single lenses being the least satisfactory. Small lenses are more easily constructed to meet this condition than are larger units. In any case, however, a *fixed object* at a *fixed distance* will cause a certain *fixed image* to appear.

If the cross hairs are located at I_1, the objective lens must be moved in or out to cause the image to fall exactly on the cross hairs. If the cross hairs are located at I_2, either L_1 or L_2 may be moved in order to cause the image to fall exactly on I_2. In all cases the eye lens L_3 looks only at image I_2, hence it needs only to be adjusted for this condition. Improper focus of lens L_3 will cause the cross hairs to appear hazy, but will have little effect on parallax. Should lenses L_1 and L_2 be so adjusted that the image does not fall upon the cross hairs, apparent movement between image and cross hairs (parallax) will be noticeable whenever the eye is moved. This condition will cause the cross hairs to appear on different parts of the field when the eye is moved.

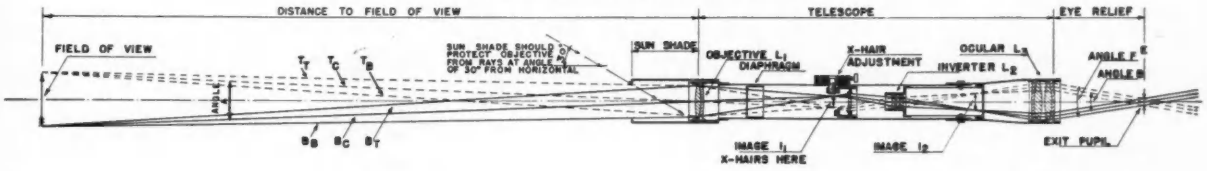
The only proper method to focus a telescope is to first adjust the ocular for perfect cross hair vision against a clear sky. This adjustment will then be perfect for any one individual and should be locked and left strictly alone. The front focusing device should then be adjusted until no apparent motion between object and cross hairs is noticed when the eye is moved. This is important if the utmost accuracy of sight is desired. Small low-powered telescopes are quite free from the need of this adjustment; large instruments of high magnification become very critical.

A point of warning about the removal of lenses is made here. If any lens, excepting the ocular, is removed it is essential that it not be rotated in replacement. Should the lens be rotated it is almost certain that the center of field will fall on a different part of the cross hairs than originally.

Occasionally a device will be found with parallax that cannot be removed. In this case the chief offender is probably thick cross hairs; however, cheap lenses and improper or strained lens mounting will warp the image causing the same trouble to appear. Fortunately most telescopes are quite free of these defects. Study of the above will show that there is no truly universal focus instrument unless parallax is accepted as being inherent to the device.

Resolution—Any optical device, including the human eye, is limited in its ability to see small objects close together and with a fixed magnification at a fixed distance, the amount of light falling on the objective becomes the controlling factor. The objective forms the first image and the ability to form detail on this image varies directly with its diameter. It is also true that magnification is a factor producing resolution of small objects. If the image is so reduced in size, by low magnification, that the eye, in conjunction with the ocular, cannot distinguish between its various parts, resolution is lost. Resolution of the eye is limited by natural laws and personal make-up. If the image has detail too small for normal seeing, it will be lost, regardless of objective diameter. Increased magnification will

Fig. 1: A typical sighting scope in cross-section



A PAPER FOR PEOPLE WHO SHOOT

Rifle Remington DUPONT News

BRIDGEPORT, CONN.
MAY, 1942

Possibles and Impossibles

by **FRANK J. KAHRS**

A very interesting letter came in the other day from a chap in California and it hits the nail so squarely on the head that I have decided to run it in the column. Here it is:

"About a year ago I wrote to ask if you could select a 37 for me, to which you replied you would be glad to. I never took up the offer because a friend here on the coast did the selecting for me. I have been so pleased with my gun that I would like to let you know about it. I believed that a fellow with a 1" gun was just lucky, but I don't think so any more. I'll bet nearly all of your 37's will do the trick.

"After getting my gun I shot groups at 100 yards outdoors, very still day, iron sights over a sandbag rest. Shot four 10-shot groups each with several brands of ammunition, one of which was 'Targetmaster.' (I couldn't get any 'Palma Kleanbore' at the moment.) I managed to 'blow' one group with each brand, but the three best groups each, 6 groups in all, of the two best brands (one of which was 'Targetmaster') made 10-X possibles when covered with a ten ring cut from another target. (I shot my groups out in the white, of course.) The groups ran just a fraction over 1" and I am convinced that indoors in a machine rest they would have been well under 1". This thought makes me very happy because now I am robbed of all alibis. When a nine shows up the only place to look for the answer is in my trigger finger (notice he doesn't say trigger) or my doping, which narrows the problem considerably."

Now in these few words you have the whole story of the 37, namely, they are all good guns capable of 1" groups—provided you use the right ammunition.

* * *

One of England's leading smallbore shots recently sent in a request for a Remington 10-X brassard, having turned in a 10-X possible at 100 yards in a National League Match last July. This rifleman had picked up some of the "Palma Match" when the 1939 team was at "Ham & Petersham" and he says that it still goes well and this is his only real 10-X up to this time. Naturally we have sent him our best 10-X brassard. In his letter he tells us that this war is bringing an enormous number of men into contact with .22 shooting and that there should be a big jump in the competitions, matches and "all the fun of the fair."

* * *

That many rifle clubs throughout the country are doing a good job of training the civilian population in marksmanship is quite true. We hear of many old time organizations that have set up the means of training those who wish to be trained in the fundamentals of marksmanship. We know of one organization that was founded in 1887 in the State of New Jersey that has a rifle team of ten members and ten alternates and a drilling company consisting of fifty men and three officers, and this outfit still continues to function actively and patriotically.

They have a civilian military school at the armory every week for the sole purpose of instructing those who are soon to be called into the service for basic military training. They have a 75-foot rifle range for the teaching of proper gun handling, sighting and firing.

* * *

Reviewing the record of attendance at shoots held in the first three months of the year indicates an increase over last year; that is, the average is above last year. Only two of the large shoots held so far fell below normal, but in each case this was due to local conditions. The Southwestern at Dallas, Texas, the other day, for instance, had a record attendance, something like 85 shooters, and at Cleveland, Ohio, recently they had nearly 100 over the preceding year. At Allentown, Pennsylvania, recently over 100 shooters, where normally 65 and less turn out. All of this is very fine and indicates increased interest in marksmanship. We are surprised, however, to note that none of the big shoots so far have planned a school of instruction patterned after Camp Perry of last year. It

HOW DAN'L BOONE KEPT HIS RIFLE BARREL IN GOOD SHAPE

When your food, your safety, your very existence depend upon the continued accuracy of your rifle, you can afford to take chances. That's why the American frontiersmen gave their guns such painstaking care. Almost as important as the need for accuracy was the fact that guns were expensive, and gunsmiths few and far between.

Dan Boone and other early pioneers used a smart method to keep their gun barrels clean:

After the powder charge had been measured and poured into the rifle barrel the shooter placed a lubricated patch over the muzzle of the gun. The bullet was placed on this patch and pushed down flush with the end of the barrel. Excess cloth was trimmed off with a knife, and the bullet wrapped in linen, was rammed home.

The linen patch cleaned the rifle bore when it was pushed down with the ramrod, so that each shot was fired from a clean barrel.

Today modern shooters fire each shot from a clean barrel, too, when they use Remington ammunition with Kleanbore priming. There is no powder fouling building up from shot to shot, with the resultant falling off of accuracy. What's more, Kleanbore priming is not only non-fouling itself, but the protective film it leaves on the inside of the barrel guards against rust and corrosion. Kleanbore priming protects rifle barrels and definitely ends the need for barrel cleaning.

Possibles and Impossibles—(*continued*)

seems to be an excellent time to consolidate the school of instruction and the competition idea. We leave the thought for those who are planning shoots later on in the year. If it is a two-day shoot, one day for school and the next day for a little competition to see what the boys learn from the school. Of course, the basic idea behind it all is to teach those who would teach others how to do it. Now how, you get the general idea.

"YOU COULDN'T CHOOSE A BETTER HERO, LAD, THAN THE AMERICAN FRONTIERSMAN!"

The Dan Boone Tree still stands in Tennessee, a unique monument to a great American. Its inscription was carved almost two centuries ago by Daniel Boone himself.

Dan may have been a little weak on spelling, but he was strong on character. Frontier life developed in Americans the love of liberty, the self-reliance and the resourcefulness which constitute our greatest strength today. The sport of hunting has helped keep those qualities alive, generation after generation.

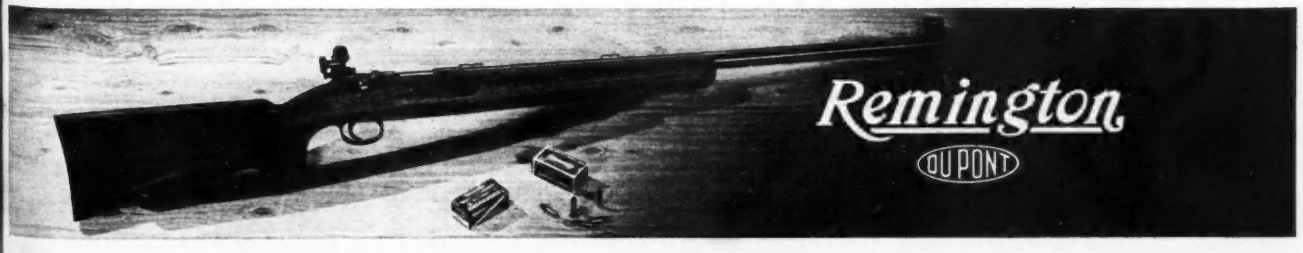
When Eliphalet Remington wanted a rifle, away back in 1816, he made it himself. It was such a good rifle that his neighbors asked him to make rifles for them. In this typically American way, the Remington Arms Company came into being.

For 126 years, Remington has been serving the sportsmen of this country, leading the way through research to ever better products. That research is responsible for the amazing accuracy and tight grouping characteristics of Palma Kleanbore and Police Targetmaster match ammunition; the walloping power of Kleanbore Hi-Speed .22's and Nitro Express shot shells; the tremendous stopping power of Remington centerfire cartridges with the new Soft Point Core-Lokt bullet; the accuracy, sturdiness and reliability of Remington guns.

Today, the technical skill and competence with which Remington has met the exacting requirements of sportsmen are applied to the achievement of our common goal—victory for our country. And every American rifle and pistol shooter can take pride in the fact that it was *his* support which built up and sustained the sporting arms and ammunition industry, which is now performing so valuable a service.

FOR THE FUTURE . . . There is one thing which the sportsmen of this country can do now that will assure better hunting in the future. That is to support the cause of wildlife restoration in every possible way. This will ensure that one thrill-packed shot at a bighorn, proud on a mountain peak . . . the intense satisfaction of waiting for a big buck in the quiet snow of the North Woods. It's a reward worth working and waiting for. Remington Arms Company, Inc., Bridgeport, Connecticut.

"Kleanbore," "Hi-Speed," "Nitro Express," "Targetmaster," "Palma" are Reg. U. S. Pat. Off.; "Core-Lokt" is a Trade Mark of Remington Arms Co., Inc.



cause a definite spread of small detail on the image and enhance resolution. Instruments that restrict light from the edge of the field will not have as good resolving power at the edges as in the center. Assuming good design, larger objectives with fixed magnification, or increased magnification with increased objective diameter, will give greater resolving power.

Conclusion—The following tabulation allows quick reference to the several properties described herein. Some conflicting requirements will become clear from the table.

For example, from the Table a large objective, good construction, small ocular, high magnification telescope can be expected to have a relatively large exit pupil, small field of view, critical and short eye relief, good resolution and critical focus.

Similar deductions may be made for any other combination of instrument qualities desired.

Desired Property	*Objective*		*Ocular*		*Scope Body*		*Magnification*	
	Large	*Small*	*Large*	*Small*	*Large**	*Small**	*Large*	*Small*
Magnification	No effect		No effect		No effect			
Entrance Pupil	Large	Small	No effect		No effect	May obstruct		
Exit Pupil	Large	Small	No effect		No effect	May obstruct		
Field of View	No effect		Large[2]	Small[2]	No effect	May obstruct	Small	Large
Eye Relief	No effect		Long[2]	Short[2]	No effect		Short	Long
Eye Position	No effect		Critical[2*]	Non-critical[2*]	No effect		Critical	Non-critical
Illumination	Good	Poor	No effect		No effect	May reduce	Poor	Good
Focus	Critical	Non-critical	No effect		No effect		Critical	Non-critical
Resolution	Good	Poor	No effect		Good	May restrict	Good[1]	Poor[1]

* Depending on design. [1] Depending on equal construction. [2] Assuming equal magnification.

So Your RIFLEMAN Was Late!

For some months now, complaints, entreaties, demands and severe questionings regarding the delivery date of The Rifleman have been flooding our Circulation Department. The Rifleman offices are not alone in this, for all publications have been struggling with the same problem, as witnessed by the recent notices carried within editorial pages of *Saturday Evening Post*, *Time*, *Life* and other leading magazines. Undoubtedly the situation is more acute with The Rifleman, however, inasmuch as so many of our subscribers participate in the exchanges offered in our classified ads.

While the mechanics of magazine publication are usually of little concern to the subscriber, it might help clear up the question of actual deliveries if we explained some of the steps and procedure.

The publication schedule is arranged with our printers, one of the largest firms in the East, so that the mailings start on a Monday, usually the last Monday in the month, ending Friday of the same week. After consultations with the Post Office authorities, areas have been defined which offer likelihood of mail delivery over a five-day period. Area number one, for instance, for the first day mailings, includes those most remote points from the Washington, D. C. Post Office, with normal delivery in 5 days. Area number two, second day mailing, next most distant points, normal delivery in 4 days, and so on. These areas are not necessarily just West to East distances, but take into consideration as well North and South and intermediate points of distribution for Washington mailings.

The postal authorities have worked out this schedule with us over a long period of years. All subscribers should normally receive their copies on the same day, but we realize the possibilities of miscarriage of the best-laid plans.

Such possibilities are greatly increased in these days. First-class mail from Washington is unusually heavy and there exist certain priorities which must be observed. The Rifleman like all other magazines is second-class mail. Once the magazine is on its way from Washington there is still the likelihood of delay, re-routing and side-tracking of even the fastest trains. Obviously, these things are beyond our control.

There are, however, certain mechanics of operation within the office with which our readers can cooperate and thereby prevent some unnecessary delays.

Change of address is one of these problems. Supposing the schedule calls for start of mailings on the 25th, the mailing stencils must be addressed in our office at approximately the same time The Rifleman goes to press. There must needs be some time to prepare these stencils before addressing the many thousands of plates. Therefore, the 15th is the latest date for the receipt of any changes of address in order for a new stencil to be made and included in its proper place in the general run of the forthcoming issue. Notices *must* include both old and new addresses. Moreover, subscribers can help greatly by renewing in advance of expiration.

One additional explanation seems necessary at this time in view of requests for special service—air mailing of magazine copies to beat the regular mailings of a particular area; requests for staff members to watch out for certain items being advertised and advise at an early date; the enclosure with these requests of checks and money orders to deposit with the advertiser to safeguard the item. Obviously, these requests if followed out would be a serious injustice to other subscribers and in no case can they be considered.

With the cooperation of postal officials we are constantly endeavoring to improve our delivery service. Individual instances of delayed delivery or nonreceipt of The Rifleman should be promptly reported to the Circulation Department for investigation.—Editor.

Any Alibis?

THRASHING OUT THE WOES OF THE HANDGUNNER . . .

Winding up a controversy—does rapid-fire practice hurt slow-fire scores? Here is a shooter who is convinced that—

RAPID-FIRE HELPS

PISTOL SHOOTING WITH ANY THOUGHT of accuracy as we know it today was probably introduced by the duellist. After duelling "went out" and ill manners came in, the pistol ceased to be a gentleman's arm and passed into the hands of the lower classes. The introduction of the revolver brought the short arm into general use again and as the gun fell into interested hands, it was only natural that skill and a competitive game should develop.

From our records we find that at a very early date scores and records were being made that compare favorably with ours of today. These scores, however, were made at slow fire. Though the revolver was the arm of choice, no shooter seems to have given much thought to its use as a rapid-fire weapon.

In 1904 rapid-fire was beginning to be shot in matches conducted by the Army and we find matches offered by the National Associations, but little patronized. Rapid-fire was a novelty and was looked on as such until about the time the N.R.A. introduced Registered Tournaments. The N.R.A., undoubtedly, caught the trend of public desire with the rapid and timed fire matches as it did with the Registered Tournament. It is to be congratulated on both counts.

As with any radical change, we have the usual contention over this one. The old slow-fire shooter objects to all this rush. His first contention is that rapid-fire shooting spoils slow-fire scores. I grew up in the old school and at first put up the same argument; but after observation and experiment, my opinions have changed and I feel that the shooter is benefited, not only as a shooter but in that his slow-fire scores are improved by rapid-fire practice. Shooting is primarily based on co-ordination of eye and hand. Anything that improves co-ordination of these must, necessarily, improve shooting, regardless of the timing.

The slow-fire shooter in his training is never hurried. He aims, squeezes, and, due to his lack of hurry, if his squeeze does not materialize, the gun drifts away from the target and he goes through the same process again and again. If fatigue does not get him, he gets it off as he wishes, but many good holds are ruined by overhold and its brother, fatigue. Now why does the shooter not get that shot off the first time? His co-ordination is just not what it should be. He lacks decisiveness, and decisiveness is just as important in slow fire as in anything else. Rapid-fire practice gives the shooter this necessary ingredient for success.

The improvement of slow-fire scores because of rapid-fire training is indirect in one instance but nevertheless present. Much of our shooting today is on outdoor ranges where frequently the wind is very much in evidence. Wind has always bothered the shooter who majored in slow fire, the reason being that it was usually necessary for him to "become set" for each shot. The rapid-fire fan when shooting in the wind waits for a more or less calm period and then fires as many shots as possible. His score may not be on a par with his slow-fire average in calm weather, but it is usually much better than a score "worried" out of his gun shot by shot, as the confirmed slow-fire shot would be apt to do when wind made deliberate shooting all but impossible.

Of what value is the perfect hold if we cannot pull the trigger? Now, do not misunderstand! We do not pull the trigger in slow-fire as we do in rapid. There is the same slow squeeze, but when the time for the let-off comes we are able to produce. Nothing gives you this ability to let off at the time you desire as does rapid-fire or snap shooting.

What is the difference between the perfect slow-fire pull and the perfect rapid-fire pull? On first thought we would say that it was simply one of time. If we analyze the perfect slow-fire pull we have a period of settlement. The gun ceases to move around the target and settles down to slow swings interspaced with intervals of rest. It is at this period of rest that we endeavor to put the final squeeze on the trigger.

In rapid-fire we have the same disposition on the part of the gun to move, but it is held more firmly and the movements are quicker. We do not squeeze and wait for the gun to settle; rather, we settle the gun with the squeeze and the squeeze is continued as the sights come into alignment. Here our co-ordination is working decisively. If we do not get the shot off when the sights are perfectly aligned, our time is off and the string ruined. This decisiveness is based on self-assurance and we act with confidence. The stress and strain and repetition of the confirmed slow-fire shooter is caused by doubt and timidity. Things look good, but before he can fire he anticipates a change for the worse. This is due to his deliberate habits and the fact that he does not have to act. Rapid-fire practice trains him to act when the moment is auspicious.

Now let's go back over the scores shot by the old-timers. We find no appreciable difference between their slow-fire scores and the slow-fire scores of today. Immediately, up comes the argument that the early shooters did not have equipment equal to ours of today. But if we compare records again, there is no appreciable difference. What slow-fire shooter of any day would feel that he faced an unworthy opponent if that opponent came from the top-ranking men of the N.R.A. classification list where they all shoot the timed and rapid stages with equal interest and, often, ability?

No, rapid-fire never hurt slow-fire. Only two things do that, lack of practice and wrong practice. Rapid-fire goes hand in hand with slow-fire shooting and, at times, it leads the way.

William Cook

The Old Coach

ON VARMINT SHOOTING

YOUR EDITOR TELLS ME that he finds it highly desirable these days to include much material dealing with War and the Weapons of War in each month's issue. But he has not forgotten that we will also look for interesting material dealing with our personal shooting hobbies. Besides being open season on Japs, spring has as usual brought four-legged varmints out of their holes. So he has asked me to drop for the time being my "war stuff" and give you youngsters something on varmint shooting.

I am very strong for varmint shooting because there is no other sport which so develops all-around skill with the rifle. It teaches stalking, range and wind estimation, the knack of discovering hidden targets, intimate knowledge of trajectory, and nail driving marksmanship in all positions and under all field conditions—particularly a dead hit with the first shot. It is the best school for the sniper, scout, or just sportsman.

In certain localities where they are doing serious damage on farms and ranches varmints are perfectly legal targets the year around. I shall not enter into our moral right to make targets of them except to say that if we do we should kill them cleanly without any suffering—a dead kill or don't shoot. And I also think it would be a grave mistake to exterminate them, and in many regions, what with poison, farmers' dogs and shooting there is grave danger of just that.

Crows are an unmitigated nuisance everywhere, doing much damage to young birds and to crops. Their numbers should be kept within bounds, and it is quite impossible to exterminate them anywhere, so I think we can always regard them as legitimate targets. At the present time this also pertains to jack-rabbits in certain localities in the West, and to coyotes in the Northwest.

Woodchucks, prairie dogs, and ground squirrels seem to fall in a special class. They are all cute little animals, they add much to our fauna, and in many places they do no damage whatever. On a farm or ranch where they are pests it is easy for a skilled rifleman to thin them out to the point where they are no longer harmful, but I do not believe we have any right to exterminate them throughout an entire region as has been done in certain cases. However with these three rodents there is also danger that we may conduct our shooting in such a way as to cause a great deal of inhumane suffering. Their young are born in their burrows, and when we kill a female with young we cause the death of all those young by starvation, and we go a long way towards extermination. There is no way to tell a male from a female before we shoot.

Three to six young are born to the female prairie dog between early March and the first of June depending on latitude and climate, and these young do not come out of their holes and begin to forage for themselves for about six weeks after birth, so that prairie dogs should not be shot before May 15th in the South or July 1st in the Northern part of their range. The striped ground squirrel of our North-Central plains have seven to fourteen young born in June and should not be shot before the middle of July. The large California ground squirrel and allied species of the West has six to twelve young born March to August and should not be shot before June in the South or before Fall in the North.

Woodchucks have two to eight young born in April in the South, and May in the North, and open season on them should be at least six weeks later. This makes the open season come after the grass has become high, and it is very difficult to see them until the haying has been done late in July or early in August so that the legitimate season is very short. However chucks are such easy targets in the early Spring that I think it is much more sport shooting two or three a day in the long grass period when much more skill is necessary than shooting a dozen in the short grass.

I trust that our little varmints will continue for many a day in fair numbers because I hope when he grows up to introduce my young grandson to the sport. There is no other way in which you or I can teach our youngsters, or our young men about to go to battle, to pick up indistinct targets 500 or 1,000 yards away, to stalk upwind and under cover to a range we have estimated closely enough to insure a killing hit with the first shot, and to hold hard in the more or less awkward position that the firing point dictates.

Nor is there any other form of shooting which will so thoroughly impress on the shooter the necessity for knowing his rifle from A to Z. Indeed this is far more necessary for success than the mere choosing between a dozen or so suitable makes and calibers of rifles. Really successful varmint shooting necessitates almost constant practice and experimental shooting. For success I should say that a rather long series of experimental firing with the rifle of your choice is necessary. Most successful shooters, I think, find it desirable to sight a modern varmint rifle so that the bullets will average striking one inch above the point of aim at 100 yards. Then the shooter must find out for himself by actual shooting how high above the line of aim the bullet will strike at 50 and perhaps (with a very high velocity cartridge) at 150 yards, and how low it will drop at 200, 250, 300, and 350 yards. What will the exact sight adjustment be for hitting 1 inch high at 100 yards (a) when the rifle is fired prone with the gunsling, (b) when resting the forearm on a soft rest, or (c) when shooting offhand? For example most of my varmint rifles shoot about an inch lower at 100 yards when fired prone with the gunsling than when I rest the back of my left hand on a stone wall, and the forearm lays in my hand. Find out just how much winds of various force and direction will drift the bullets at various ranges. Find out what difference and how much is caused by the firing of the first shot from a clean, cold bore, and how much by a cold, fouled bore. Does temperature cause any difference? Fire close towards the sun and determine the best form of lens shade to use when you get a field shot under such

conditions. And lastly find out the most accurate and best wind bucking load to use. In the matter of loads I would strive first for accuracy, second for flat trajectory over long range, and third for wind bucking. All of the above data should be determined for the particular load you decide to use in the field. Remember that any inaccuracy or any change in conditions of rifle or weather that causes a deflection of an inch at 100 yards means 2 inches at 200 yards, and that is enough to cause consistent misses on crows at 200 yards or chucks at 300.

Then there must be continuous target shooting, weekly if possible, to keep in good shooting form. The coordination of hold, aim, and squeeze must be perfect to hit small varmint targets at long range. The tension of holding must be kept uniform by constant practice. The shooter out of practice can easily vary the tension of his position, or the way in which he takes up the recoil, enough to cause him to miss a chuck at 150 yards without his being at all aware of the cause. I should say that a successful varmint hunter ought to fire at least 20 rounds in practice for every shot he fires at game.

And do not neglect to continually verify your sight adjustment so you will be sure your rifle shoots just about an inch high at 100 yards. Even the best rifles do not always maintain a constant elevation and zero. They may change enough at any time and without any apparent cause to make you miss a chuck completely at a hundred yards. Of course there is a reason but often it is a mystery. Lately I had one rifle change its windage zero 8 minutes from one day to the next, shooting just as well with its new zero as with the old, and for no apparent cause at all.

From the standpoint of sure hitting and killing at long ranges I should say that under the normal market conditions that existed a year ago the very best varmint rifles were Gebby-Varminter with heavy barrel, or a .220 Winchester Model 70 Target Rifle (10½ pounds) fitted with a target scope of eight or ten power and a scope stock, and using hand-loaded ammunition with selected bullets. But such rifles cannot be had today.

Considering the rifles and the factory cartridges which can be obtained today (if you try hard and are lucky) I think a .22 Hornet rifle will be found to be the most suitable. Indeed, of all the varmint rifles I have shot the Models 54 and 70 Hornets have given the best accuracy and reliability with factory ammunition. By trying several makes of factory ammunition at least one will be found which will average 1.5 inch groups at 100 yards which is plenty good enough considering the sure hitting range imposed by the trajectory and wind bucking.

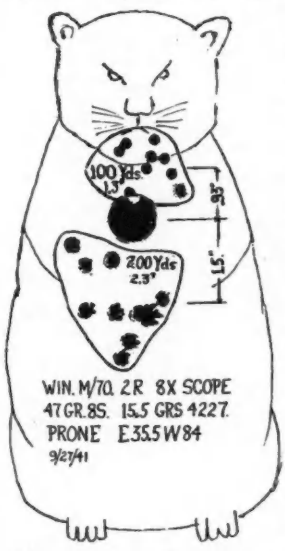
My varmint shooting started forty-three years ago using first black powder .25 caliber rifles, and I have used all calibers and types since then as arms and ammunition have developed. But I have used the Hornet quite as much as all other makes and calibers combined, having shot literally hundreds of crows, woodchucks, prairie dogs, and jack-rabbits with it, as well as a goodly number of hawks, owls, skunks, porcupines, grouse, and one fox, and I have always considered a good Hornet an extremely satisfactory rifle. Its advantages are its accuracy with factory ammunition, and its light report. Its only disadvantage is its limited sure hitting range.

If a Hornet rifle be sighted with factory ammunition to strike 1 inch high at 100 yards it will strike ½ inch high at 50 yards, be on the point of aim at 150 yards, 1 inch low at 175 yards, and 4 inches low at 200 yards. Except under the very worst wind conditions (which I have almost never experienced) I could be quite sure of hitting a chuck certainly up to 175 yards, almost always to 200. Crows and prairie dogs present a much smaller target and the dogs have more vitality than any other varmint so that a very central hit is necessary to kill humanely. Also both are liable to move at any instant and your shot will be more hurried on them. Thus because of the smaller target, the thought that you must fire quickly, the limitation in accuracy, and possible wind deflection I found that with the Hornet any sure range on these varmints was hardly over 125 yards.

For the past three years your Old Coach has been shooting a varmint rifle for the 2-R Lovell cartridge with very excellent results. Of course such a rifle cannot now be obtained except second hand. It is a handloading proposition entirely and that also is now impossible unless you happen to have cases, primers, powder, and selected bullets. But if you are already so equipped I think that you will agree with me that a good 2-R is a superb varmint rifle. It has a very satisfactory sure hitting range without the noise and expense of the heavier rifles. As compared with the Hornet rifle its trajectory is much flatter, and if certain proved handloads are used its accuracy and wind bucking qualities are also superior, and I should say that its sure hitting range is about 75 to 100 yards further than that of the Hornet.

Last summer it occurred to me to try an experiment to see how much better this 2-R rifle would be on prairie dogs than my Hornet.

I cut a silhouette out of cardboard (see cut) 10 inches high, and stood it up in the grass 100 yards away, and fired ten shots prone at it. The rifle was sighted to strike an inch high at 100 yards, and aim was taken at the little black bull on the dog's chest. As shown, this group measured 1.3 inches, with its center .93 inch above the point of aim. Then I set the silhouette back to 200 yards, and again fired 10 shots prone at it with same sight adjustment and aiming point. This group measured 2.3 inches and was 1.5 inches below the point of aim. I think the target is very interesting, and it seems to indicate that this rifle should be sure on the little sod poodles to 200 yards at least. The target also indicates the very flat trajectory of this 2-R load, a drop of only 1½ inches below the line of aim at 200 yards as compared with about 4 inches for the Hornet factory cartridge.



Thus if you wish to make the desired large proportion of hits and clean kills on varmints I think you should do a lot of experimenting, verifying, and practice in between your hunts. Remember that in the field you do not have any sighting shots and you scarcely ever know where your misses struck.

POWDER SMOKE: READERS COMMENTS THE NEWS DESK

RE-LOADS . . .

WEST COAST DEFENSE

Editor, AMERICAN RIFLEMAN.

It is a singular fact, but none the less true, that every so often the country is thankful for the straight shooting rifleman. After Pearl Harbor regular law enforcement agencies on the West Coast were over-taxed with the extra burden imposed by the emergency. They needed help. There were bridges along the important coast highway to be guarded, power plants, all those things which are essential to the productive effort.

Out of the small towns, the cities, and from the ranches they came, just everyday citizens doing a job which had to be done. There was no frantic searching for guns to arm them. They brought their own rifles and ammunition. The evening after Pearl Harbor, bridges were being guarded, power and manufacturing plants made secure by these silent men.

It is unfortunate that others couldn't see these riflemen on guard along the West Coast. It would perhaps have clarified a proposition which the riflemen have maintained for years. Suppose those anti-gun cranks had had their way. There would have been no well armed group of hunters to take over the responsibility. No one could bring his rifle, assume this duty, if he had been deprived of his right to own a gun before the emergency.

Now, with the West Coast states organizing rifle companies, the deer hunters may have the opportunity of exemplifying their training. At least a number of us woodsmen and ranchers believe so. Here is the largest standing body of timber in the United States. During the summer months it is extremely dry, even on the coast. Fires could give plenty of trouble.

Landing from enemy subs along the many lonely beaches is a possibility. These small raiding parties, properly timed, could cause a lot of trouble. Disappearing into the forests they could make it extremely interesting by setting fires, wrecking railway lines, and attempting to terrorize the people.

The effective answer to the problem is the snapshooting West Coast deer hunter. These men are excellent woodsmen. Most of them have had experience in fighting fires. To them the burden of mopping up the small raiding parties would be something which they could accept with confidence. These men, who can get on the trail and read every sign like an open book, where the least displacement of a leaf has its message, would have more surprises for the raiders than Hitler has empty promises for the German people. Such men with the ability to fend for themselves, a quick eye and steady nerve can be depended upon to handle the situation successfully. Many of them living in the remote sections are not organized into rifle companies, and this should be corrected. They should be enrolled, not so much for the purpose of drill, but to keep in touch with them. Then they could be notified when and where they are needed.—*Francis E. Sell, Riverton, Oregon.*

WORD FROM HONOLULU

Honolulu, Hawaii.

Editor, AMERICAN RIFLEMAN.

Just a few lines from this side of the puddle. Saw the entry blank for the matches over here in the Timed-Fire column so thought I would add my two-bits worth. In the first place (Marines or no Marines), we still have the situation well in hand.

One would naturally think that shooting matches would be nil at this time but the reaction is very much the opposite. Captain Mookini of the Police Department has had open house every day at the Police Pistol Range, which is a very nice range with thirty-two targets with its palm-covered firing points and turning targets. At any hour of the day the public is free to come down for practice.

Don't think that the shooting is confined to men because it isn't. Three days a week we have a class for women, ably tutored by three of our charming ladies of the shooting fraternity; Mrs. Helen Ching, Miss Alice Marshall, and Miss Naemomi Mookini, the daughter of our police captain. And you would be surprised at the turnout and at the seriousness of the pupils; women rushing from work to get down and bust a few *hulls* before going home.

Every other Sunday we have a match sponsored by the Police Department comprising five events with about one hundred and fifty entries. And again the serious way they go about it is shown by the scores chalked up; shooters who are in the marksman class turning in such scores as 272 over the short national course with a .45 auto. Every time I step up on the firing line with my smoke pole some marksman is pinning my ears down and making me like it.

We haven't had a registered match this year, but give the Captain time as he is truly a busy man these days with all his activities, and training of new recruits for the force.—*Earl R. Bradshaw, Warrant Officer, U. S. A.*

ESTIMATING DISTANCE

Editor, AMERICAN RIFLEMAN.

In the April issue of THE AMERICAN RIFLEMAN, I find an article by the Old Coach which is very interesting and which may be of great benefit in training for prospective army service. However, it seems to me that he has overlooked one very important fact. It must be remembered that in actual combat the enemy does not always appear at exactly 50 yards, 100 yards, or at any previously measured distance.

If the target frames are erected on movable bases and placed at odd distances from the firing line and the shooters are not informed of the exact distance, the necessary training in estimating distances will greatly improve their marksmanship under conditions which they will find in actual combat.

Estimation of unmeasured or unknown distances should constitute a considerable part of the training of prospective soldiers. The above is offered as a suggestion, and not as a knock at the Old Coach whom I admire.—*C. E. Mowder, Akron, Ohio.*

TIMED FIRE
With Bill Shadel

In this Issue: We're calling your attention to "Minute Man, 1942," for it is the NRA's official plan, now available in booklet form and in greater detail than the condensation on page 26. Worked out with the approval of the Third Corps Area Commander, Major-General M. A. Reckord, and now receiving consideration by the Provost Marshal's office who has charge of internal security of the United States, it is offered as an answer to the many variations of a sound idea springing up all over the country. The much-needed order and uniformity will come from the adoption of this plan and counteract the fears of official Washington and also the NRA's—that no armed bands will be roaming the countryside, springing up from independent leadership; an elite guard, storm trooper movement or what have you, *BUT* on the contrary, well-trained marksmen groups under duly authorized authorities, Corps Area or State, then county, sector and unit. Widespread distribution of the plan is urged by our members, so read the article, study the plan, and send for the number of booklets you need to pass on to your local authorities. The Governors and the Adjutant Generals of the states have been sent copies and already many favorable replies are coming in to the NRA office.

You select a story. This month we have reprinted a great shooting story by a great writer (page 11). Believing that many stories appearing some years back are too good to be forgotten, we will dig out some more from time to time if there's sufficient demand. RIFLEMAN stories, in particular, may have been lost through your discard of an old file and there's always that new group of subscribers who might benefit. Harry Pope's "Off Hand Shooting" was one of these we revived for you in the December issue—a wise choice it seems from your many comments. We'll be glad to have you make the selection, next time. Do you like the idea?

Ban on Guns: As we go to press, unofficial word indicates the "freeze" order on firearms will be lifted by the War Production Board on or about June 1, as originally promised in General Limitation Order L-60. It is probable that all stocks of firearms now in the hands of dealers, jobbers, and distributors will be released for sale in the normal way to the public *with the exception* of the heavy-gauge shotguns, center-fire pistols and revolvers, .30 caliber rifles and some of the .22 caliber "training" rifles and pistols. These guns will be purchased soon by the Defense Supplies Corporation for allocation by the Government Requirements Bureau to federal, state and local law-enforcement agencies. In the NRA's many contacts with Washington War Boards and Bureaus the needs of our clubs for .22 "training" rifles has not been forgotten and there is considerable basis for the expectation that a limited number will be available for clubs carrying on a definite training program.

KEYSHOP GUNSMITH

Editor, AMERICAN RIFLEMAN.

Today I witnessed an accident which set me to wondering how many of the same kind are being courted all over the country.

A friend of mine purchased a Savage, 219 utility 410 and 30-30—which is a splendid little kit. He also purchased a little Weaver 29S with T mount to use on his 30-30 barrel which would lead to more hits. This was sound reasoning, and good buying.

He could not mount the scope himself so he took it down to a keyshop and machine shop here and asked the fellow if he could tap it and mount this scope. The "Village Smithy" told him certainly; that he had mounted hundreds, maybe thousands, of them.

This morning we went out to target it and do some plinking. We set up a target and got set for a fifty yard try. I went along to watch. I stood behind him and to his left when he fired. There was buzzing noise as the scope flew end over end about 20 feet up into the air and came down behind me; had I been a good outfielder I could have snared it. His eyebrow and forehead and left cheek was badly burned, his left wrist and forearm burned also, but by luck not seriously.

We examined the gun and upon ejecting the shell we found a round hole about 3/16 inch in diameter about ½ inch from the base which the jack-of-all-trades had drilled clear through the thick part of the barrel and tapped it out. Both screws were gone without trace. So his barrel is ruined. He is lucky that he can see. I am lucky that I was not in the path of one or both of the departing screws.

But why will fellows take their guns to just any guy who says he can do such work? Why invite trouble? For another dollar a real gunsmith would do this job.—*H. W. Palmer, Brownsville, Texas.*

ROPE FOR BARRELS?

Editor, AMERICAN RIFLEMAN.

In the May RIFLEMAN Underhill and Reen say that the British are often clever gun designers. Must be, must be! No American could ever pipe steam from a machine gun water jacket down a length of rope as shown on the Vickers, page 10. Wonder if they couldn't use rope for the barrels too? It would have the twist built right into it.—*Paul St.-Gaudens, Coconut Grove, Fla.*

Could be, could be! But Reader St.-Gaudens should remember that at about the same time, American troops were running around with hunks of wood labeled "mortar" and "AT gun," and riding in trucks with signs on them that read "Tank."—ED.

SAVING BRASS

Editor, AMERICAN RIFLEMAN.

The item on page 37 of your May issue, "Brass Salvage," should be a good reminder to all clubs to save their brass. We always saved our brass and sold it, so we didn't have to be reminded of its value. When we received a letter from the DCM we gathered up one hundred pounds of brass and shipped it to Raritan Arsenal and believe we were the first club to do so.—*Charles T. Demport, Onondaga Rifle Club.*

Smitty Brown has plenty to do when the Tampa Mid-Winter Tournament rolls around, between promoting the shoot and doing some firing of his own. But he is never too busy to help a youngster out. The little southpaw on the right appreciated it, too, when Smitty revealed a few trade secrets. His expression proves he isn't missing a word of it.

NEW BOOKS:

THE SPECTER OF SABOTAGE

By BLAYNEY F. MATTHEWS

Too frequently we are inclined to vision sabotage as purely "industrial" damage, far removed from our own every-day lives. Yet in modern warfare it is a lurking, ever-present menace to both the physical and mental health of us all. Our bodies and our minds can be poisoned just as easily as factories can be destroyed!

The early pages warn against the many ways in which our personal lives and the country's enormous natural resources are menaced—and it is not a pleasant picture. No specific suggestions are made as to proper protective measures; it is inferred that these are the responsibilities of Government.

But in the later pages, relating entirely to the problems of industrial protection, detailed and specific instructions are given for the proper establishment and efficient control of both external and internal plant security. This section is a "must" manual for all those who are in any way responsible for the uninterrupted production of our factories.

"The Specter of Sabotage" by Blayney F. Matthews, Lymanhouse, Los Angeles, 1942. 256 pages. Obtainable through NRA Book Department, $3.00 postpaid.

"DU PONT—140 YEARS"

By WILLIAM S. DUTTON

Tracing the development of an industry, particularly a new industry might well be a dry compilation of facts and historical sequences but in this book, the author has avoided such a pitfall through use of the many interesting personalities within the history of Du Pont organization and their part in applied chemistry, from gunpowder to nylon. We say it is the story of new industries for the writer takes us through the long list of Du Ponts who, by broad vision and constant venture, seem to have been in on the first research or at least the application of this research to commercial products pioneered and merchandized by Du Pont.

From the early struggles with the establishment of a small gun-powder factory on the banks of Brandywine Creek in 1802 to the far-flung industries empire embracing dyestuffs, rayon, cellophane, lacquers, plastics, the book gives an insight into the relationship of product and by-product, explosives and household necessities. It is a book for the layman, not necessarily the scientist.

Only occasionally does the writer let his enthusiasm carry him to over-emphasis in answering the critics of the "merchants of death" thesis. In view of the facts related, which speak for themselves of patriotism and cooperation with the government in any number of emergencies, this rather obvious defensive attitude becomes slightly nostalgic when the author goes out of his way to stress the moral.

For a refreshing dip into applied science and a background to many products affecting our everyday living and the industrial planning which goes into such an evolution, this biography of business is well worth reading.—W. F. S.

"Du Pont—140 Years" by William S. Dutton. Charles Scribner's Sons, New York. 396 pages. $3.00.

HAYWARD FINISHES ONE-TWO IN INTERSCHOLASTICS

National Interscholastic Rifle Team honors went to the West Coast in a big way this year as two entries from Hayward (California) High School finished first and second in a field of forty-four. The scores were 1070 for the Hayward High day school squad and 1069 for the Hayward Evening High School foursome. Xavier High of New York, the pre-tourney favorite, turned in a creditable 1067 which was good for third place.

Hayward's totals, fired on its home grounds in one of the 12 sectional matches which made up the national race on April 18, were: First team, Dale Willadsen, 264; Charles Schwarz, 268; Frank Tassano, 271, and Bruce Tosslin, 267. Second team, Arthur Baylig, 270; Robert Johnson, 277; Phillis Grim, 264, and Robert Carden, 258.

Xavier, winner of the Far Rockaway, N. Y., sectional, was led by John Baldwin's 271. Charles McAuliffe and George McGuire had 266's and Edward Grady a 264.

Other sectional winners were: Woodberry Forest at Washington, D. C., fifth nationally behind Far Rockaway High; Royal Oak (Michigan) High, sixth nationally and winner at Ann Arbor; New Haven High, seventh nationally and winner at New Haven; Upper Darby (Pennsylvania) High, eighth nationally and winner at Philadelphia; Oakmont High, winner at Oakmont, Pa.; Nanty-Glo High, winner at Nanty-Glo, Pa.; Russell High, winner at Atlanta, Ga.; Cincinnati Country Day School, winner at Cincinnati; New Platz High, winner at New Platz, N. Y.

Edward Jaeger of Far Rockaway High outranked Woodberry Forest's William Hopkins after both had turned in individual totals of 279, to win the National Interscholastic Individual Championship. Jaeger had a three-position score of 99-89-91—279; Hopkins had 99-92-88—279. The South came in for its share of the glory when J. W. Dempsey of Russell High took third spot with 276, one point up on B. DeGraf of San Francisco High and Phillip Mittelman of Far Rockaway. Georgene Grad of Cincinnati Country Day topped girl competitors in the individual with 264 points. Total individual competitors was 164.

NEW DENVER POLICE RANGE RANKS WITH FINEST

Two years ago it looked as if money would not be available to equip the allotted pistol range space in the basement of Denver's new Police Building. That is, it looked like it until Police Chief Hanebuth managed an appropriation.

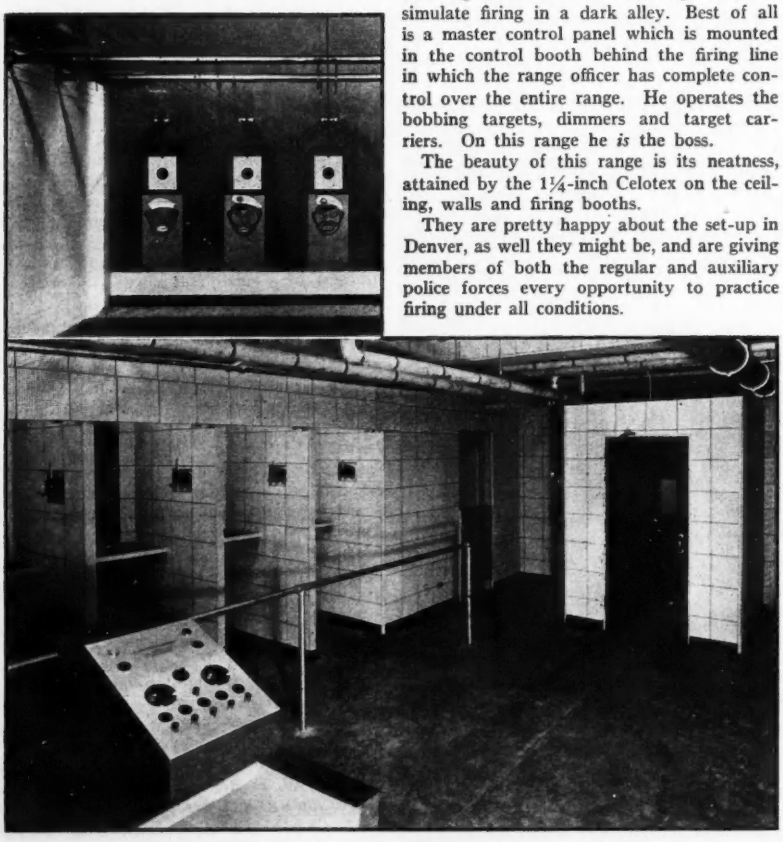
The range is complete now and has been in use for some time but, as the pictures show, it is no ordinary range. So, for the edification of those who like to do their shooting under the best possible conditions, the facts are these:

The Denver range has five firing points and may be used for pistol work at 50, 60 and 75 feet. Automatic target carriers may be stopped and stabilized at each of those distances. Each firing point also has a bobbing target.

Then, too, the lighting system is something unusual as the view of the targets will attest. That light can be dimmed enough so as to simulate firing in a dark alley. Best of all is a master control panel which is mounted in the control booth behind the firing line in which the range officer has complete control over the entire range. He operates the bobbing targets, dimmers and target carriers. On this range he *is* the boss.

The beauty of this range is its neatness, attained by the 1¼-inch Celotex on the ceiling, walls and firing booths.

They are pretty happy about the set-up in Denver, as well they might be, and are giving members of both the regular and auxiliary police forces every opportunity to practice firing under all conditions.



The new range of the Denver Police Department (see Col. 2)

ANNUAL OPEN ROAD RIFLE MATCH IS UNDER WAY

May 20 marked another opening day for the Open Road National Rifle Match as firing began in the ninth annual boys' tourney sponsored by *The Open Road For Boys* magazine in cooperation with the National Rifle Association. For the three months starting with that date boys all over the country will have an opportunity to shoot for some grand prizes which include six new .22 caliber rifles, Lyman sights and a long list of trophies, medals and pins.

You don't have to be a crack shot to enter or even to win one of the prizes. In fact, you don't have to be a shooter at all. The entry list is broken down into three classifications, one Expert and *two* Tyro so there is no worry about shooting out of your class. Besides, you have until August 18 to learn to shoot or to improve.

The match is open to anyone under nineteen years of age. If you have ever won a qualification or competitive medal from the NRA or any NRA match you will be an Expert. If not, you belong in one of the two Tyro classes, depending upon the weight of the rifle you use. The rest is simple. Send for your targets; shoot when you are ready. It only costs 10 cents so even the losers will be winners when they receive the bronze Open Road Marksman pin awarded to every contestant. Address Rifle Match, The Open Road for Boys, 729 Boylston St., Boston, Mass., for an entry blank and full particulars, or get a copy of the magazine.

Henry William Gerrans

Henry William Gerrans, 66, died in Gorgas Hospital, Canal Zone, April 1, after a prolonged illness. He had been retired from the Panama Railroad Company since 1938. Interment was at Corozal Cemetery, Corozal, after high Masonic services at the Ancon Masonic Temple.

Mr. Gerrans was prominent in rifle shooting locally and nationally until failing health a few years ago forced him to retire from active participation. He was an international railway small bore shooter and captained the East team in an East-West match at Camp Perry.—*J. M. Thompson, Balboa Heights, Canal Zone.*

Early Z. Etter

Officers and members of the Hummelstown Shooting Association, of Hummelstown, Pennsylvania, keenly felt the death in April of their president, Early Z. Etter.

Mr. Etter was one of the leading shooters and sportsmen of his community and had worked hard over many years for the improvement and expansion of the shooting sport.

Louis Claude Roujon

Louis C. Roujon, charter member and officer of the Arlington Rifle and Pistol Club, Arlington, N. J., passed away at his home April 2 after a brief illness.

"Lou," as he was familiarly known to many members of the small bore fraternity for the past 20 years, was keenly interested in the junior division of his club, which he had helped to organize and instruct.

ALL-AMERICAN RIFLE TEAM

1942 "GOLDEN BULLETS" WINNERS NAMED

NO ONE TEAM DOMINATED the 1942 N. R. A. Intercollegiate Rifle Team—the Golden Bullets—although two eastern schools, Lehigh and Penn State, each succeeded in placing two men on the first ten. Thirteen schools are represented in the entire squad of twenty top-flight collegiate shooters. Eastern shooters monopolize the first team, accounting for eight of the coveted awards. One award travels to the West Coast and the other will find its owner in Kansas.

SMITH

David R. Smith, Lehigh University senior, is easily the outstanding member of this year's team and has a strong claim to the highest individual rating since the N. R. A. first began this annual recognition of the best men in the intercollegiate shooting field. Smith is one of only two men ever to gain a berth on the All-American team for all three years of their varsity competition. In 1938, Midshipman Kitch of the Navy team preceded him in this accomplishment. Dave holds the Lehigh shoulder-to-shoulder and postal match records with scores of 288 and 291, and has been captaining his team for the past two years. Firing at the Annapolis Sectional Tournament he turned in scores of 284 in the individual event and 285 in the team match, including a kneeling "possible" as part of the latter score, and earned a 1942 All-American rating of 283.8.

RINEY

Curtis L. Riney, junior of the University of California at Los Angeles, holds the highest All-American rating, 285. Although dropping to a 279 in the individual match after a fine 282 in the team event at his Sectional, Curtis' season average of 289.5 in shoulder-to-shoulder firing earned him a high position on the Golden Bullet squad.

John A. Kimberley, the second member of the Lehigh team to win one of the 1942 awards also is a senior. His outstanding shooting is magnified by the fact that he had never shot a rifle before coming to the University. Jack held the Vice-Presidency of the rifle club throughout the 1941-1942 season. At Annapolis he paired with Smith in the team match with a score of 285 and also turned in a splendid 281 in the individual. Kimberley has an All-American rating of 280.8.

KIMBERLEY

Theodore Shidler, of the Municipal University of Wichita, deserves special mention as the only sophomore to make the 1942 All-American squad. Shooting consistently in the Sectional Tournament, Shidler turned in scores of 278 and 280 in the individual and team matches. With a season average of 281.5 his rating is 280.3. A member of numerous campus organizations, Ted is also an honor student in the engineering school.

SHIDLER

The selection of M. H. Sappington of the United States Naval Academy to the 1942 team, marks a return of Navy shooters to All-American ranks. After having had Navy men on the first four teams from 1936, the year of the first selections, no midshipmen succeeded in gaining places during 1940 and 1941. However, Sappington's splendid firing at the Sectional Tournament easily earned him his 1942 award. Ranked seventh nationally in the individual match with a score of 284, he also paced his team with a 282 in the club match.

SAPPINGTON

Ulrich A. Geller, Maryland University junior, has been busy throughout the past season earning his All-American rating. Firing in eighteen postal matches and ten shoulder-to-shoulder affairs, Geller is rated at 279.6. A highly consistent shooter, he fired 282 and 278 in the Sectional individual and team matches. Geller's coach endorses his sportsmanship, leadership and cooperation — necessary qualities for an All-American.

GELLER

Harold W. Yount, junior from Pennsylvania State College, is co-captain of the Lion team, and holder of the varsity "S" for two years, varsity team gold medal 1941 and 1942 and N. R. A. Intercollegiate Expert qualification. Yount has been active not only on the varsity but also as a member of the R. O. T. C. and Engineers' rifle teams, acting as captain of the former. Harold has also done considerable instructing of civilians and acted as assistant director of the 1942 Pennsylvania High School Rifle Team Tournament. His scores of 281 and 284 in individual and team firing at the Sectional matches boosted his annual shoulder-to-shoulder average of 275, to give him a rating of 278.75.

YOUNT

CHANDLER

Howard Chandler is a junior and team captain of the Polytechnic Institute of Brooklyn shooters. Firing at the Annapolis Sectional Tournament, Howard not only won the National Individual Championship but set a new record for this event. His 286, with an exceptional standing score of 94, outranked all previous records. Participating in thirty-five shoulder-to-shoulder matches during the past season, he averaged 182 over the twenty shot, four-position course popular in the metropolitan area. National Champion Chandler is the second shooter to represent Brooklyn Poly on All-American teams and the first Metropolitan team member to receive this honor since 1938.

WISE

Richard A. Wise is completing his last year as a cadet at the United States Military Academy. Although sick and in the Academy hospital throughout the season, Wise, captain of the Army team, arranged nevertheless to fire in eight shoulder-to-shoulder matches and to maintain an average of 271 for these events. Much of the credit for the Army team's victory in the National Team Championship is due to his personal efforts. Cadet Lieutenant Wise was easily the outstanding shooter in his Sectional Tournament performance with his two scores of 285. His All-American rating is 278.

LE WORTHY

George W. LeWorthy, senior of Pennsylvania State College, has been active in the shooting game since he fired as a member of his high school team. Holding his varsity "S" and rifle team gold medal, both for two years, LeWorthy won the 1942 senior gold award and N. R. A. collegiate expert qualification; he has acted as freshman team captain his first year and as co-captain of the varsity for the past season. Member of the honorary activities society, he is recognized as a campus leader. He turned in scores of 281 and 280 in the Sectional events. His All-American rating is 278.5.

The Second Team:

JAMES R. CANNING, *Senior*, U. of Idaho
THEODORE G. SCOTT, JR., *Senior*, Lehigh
LAWRENCE LASPADA, *Senior*, U. of Pittsburgh
JOHN W. BAER, *Junior*, U. S. M. A.
DAVID F. GROSS, *Senior*, Oregon State College
ROBERT KUCK, *Junior*, Ohio State University
ROBERT RICE, *Senior*, U. of Minnesota
PAUL W. NEWGARDEN, *Junior*, Maryland U.
LEONARD L. JOHNSON, *Junior*, Ohio State
HOWARD F. WEHRLE, *Junior*, U. S. M. A.

TOURNAMENT REVIEWS

U. S. Aggies Rifle: Out-of town riflemen carried away most of the individual spoils in this April 15-19 gallery event at Washington. New Yorkers in particular, led by Arthur Jackson of Brooklyn, had a field day in winning five of the six contests. Jackson was top in the three position match with 291, the four position with 194 and the standing with 188. Otto Kolb, Brooklyn, won the prone-sitting with 198 and then teamed with Jackson to cop the two-man prone-sitting. The other individual event went to Gilbert Moriconi of Richmond, who turned in 300 and 50 tens in the individual prone. Two Eleanores—Colklesser of Washington, and Dunn of New York—divided women's honors. Mrs. Colklesser took two medals and Miss Dunn three. The local Maritime Commission club turned in a four-man team three-position total of 1102 x 1200 to whip a field of ten for the Evening Star Trophy, while the National Capital women's team fired a prone score of 1189 to win their match.

Arrowhead Pistol: This 1942 Minnesota shoot produced a new champion in Guy H. Paris, Duluth, who copped the aggregate with 817 x 900 at Eveleth April 19. Succeeding Alice Wood who wasn't on hand to defend, Paris trimmed John Rankila of Virginia by eight points after winning three of the four events. He scored 178 slow fire, 188 rapid fire and 270 over the three stage gallery course. Rankila's 187 was good at timed fire. Later, teaming with Mrs. Tyl Johnson, Rankila shared top spot in the two-man team match. Their score was 543 x 600. R. R. Bush, Baudette, copped Sharpshooter honors with 792 in the aggregate. Marksman Ernie Juola led his class with 781.

Arrowhead Rifle: Roy Emerson of Superior garnered his second leg toward permanent possession of the grand aggregate trophy at this sixth annual tourney April 12 at Eveleth, Minn. Emerson took two of the four fired events and wound up with a total of 589 to beat out George Monson of Hibbing by three points. It was nip-and-tuck all the way until the final event—standing—when Emerson made up a one-point deficit by winning the match with a 94 score. Both Monson and Emerson had fired possibles in the prone and sitting stages and Monson's 96 kneeling gave him a point. But then came standing and the Hibbing Master fell off the pace. Class honors in the aggregate went to Expert Hans Nielson of Askov, and Sharpshooter Fred Lindberg of Cook.

Coronado Cup Rifle: Honors in this annual New Mexico Rifle and Pistol Association tourney stayed right in Santa Fe when firing was completed April 26 on the two one-week-apart stages. The course is 10 shots army standing and 10 shots rapid-fire sitting at 200 yards, and 20 shots slow fire prone at 600 yards. First leg on the prized trophy was attained by the Santa Fe Rifle Club team which turned in 931 to trip New Mexico Military by 22 points. Seven teams were entered. L. D. Wilson of Santa Fe fired a top of 191 in the individual, two points over R. E. Cook, Santa Fe, and Tode Brenneman, Roswell.

COMING EVENTS

The registered tournaments are indicated as follows: B—State Championships or large District Matches; C—Local. *Unregistered* matches are not coded. Classification of competitors for prize awards indicated by asterisk—C*, etc.

RIFLE

JUNE

6–7 Georgia (C*), Georgia State, Atlanta. Hal Drake, P. O. Box 58, Station D.
7 California (C*), Western Small Bore, Richmond. E. J. Martin, 325 12th St.
7 Colorado (C), Colorado Rifle Club Small Bore, Denver. Henry Kircher, 3030 Bellaire Street.
7 Indiana (C*), Registered Rifle, Anderson. Eugene Martin, 227 West 38th Street.
7 Minnesota (C*), Annual Rifle, Albert Lea. Art M. Jenson, 217 South Broadway.
7 Missouri (C*), Heart of America, North Kansas City. T. A. Bradley, 6121 Olive, Kansas City.
7 New York (C*), Finger Lakes Small Bore, Canandaigua. Edward R. Burmeister, 703 White Street.
7 New York (C*), Forbes Rifle, Nassau. Henry W. Ristau, 38 Walker Street, Rensselaer.
7 Pennsylvania (C*), Spring Rifle, Brommall. Lawrence Oster, 2800 Township Line Road, Llanerch.
7 West Virginia, Outdoor Rifle, Wheeling. Gaylor Hess, 1100 Elm Street, Bridgeport, Ohio.
7 Wisconsin (C*), County Live Small Bore, Racine. Oliver J. Moody, 5527 N. 35th Street, Milwaukee.
7 Florida (C*), Gulf Coast Rifle, Winter Haven. L. W. Abrams, 705 Prospect Avenue, Clearwater.
7 Ohio (C*), Logan Rifle Club Tournament, Logan. D. E. Jacoby, Logan.
6–7 Washington (C*), Inland Empire Small Bore, Spokane. Mrs. Mary E. Holt, 4118 N. Howard Street.
13–14 Oklahoma (B*), Magic Empire Rifle, Tulsa. Ray B. Whitaker, 114 South Detroit Street.
13–14 New Jersey (C*), Registered Rifle, Packanack Lake. M. J. Alexander, Packanack Lake.
14 Pennsylvania (C*), Northern Tier Rifle, Galeton. Basil Fuller, 47 Germania Street.
14 Oregon (C*). Columbia-Willamette Rifle, Portland. E. L. Plogg, 1911 S. E. Ankeny Street.
14 South Dakota (C*), Four State Rifle, Sioux Falls. H. E. Burchfield.
14 Missouri (B*), Missouri State Small Bore, St. Louis. John D. Whitney, 3117 Longfellow.
14 New Mexico (C*), Southern New Mexico-West Texas Small Bore, Las Cruces. Joe P. Medinger.
14 New York (C*), 5th Annual Small Bore, Glens Falls. James H. G. Morrison, Box 63.
14 Maryland (C*), Pointers Rifle, Rossville. James F. Ambrose, Jr., 615 E Street, Sparrows Point.
14 Michigan, Wayne Small Bore. Max O. Lee, 10401 E. Jefferson Ave., Detroit.
14 Massachusetts (C), Registered Rifle, Shelburne Falls. Emory C. Broadhurst.
14 Illinois (C*), Sheridan Club Rifle, Deerfield. B. E. Meyer, 919 Forest Avenue.
20–21 Iowa (B*), State Small Bore Rifle, Des Moines. G. G. Cooper, Telephone Bldg., Room 816.
20–21 Texas (B), State Small Bore, Austin. John F. Callan, 405 East 30th St.
21 Wisconsin, County Line League Spring .30 Caliber, Racine. Oliver Moody, 5527 N. 35th St., Milwaukee.
21 New York (C*), Summer Rifle Tournament, Oneida. Donald D. Devitt, State Police.
21 New York (C*), Long Island R. & P. Small Bore, Woodbury. Hubert B. Guckel, 1511 150th, Whitestone.
21 Maine (B*), State Small Bore, Skowhegan. Samuel Clark, Jr., % G. S. Flood Co., Waterville.
21 Pennsylvania (C*), Phila. Marksman's Rifle, Ambler. Harold Walcoby, 114 Hartrauft Ave., Norristown.
21 Colorado (B*), State Small Bore, Denver. L. F. Markle, 1006 O'ive St.
21 Michigan (C*), Outdoor Small Bore, Flint. A. J. Marxhausen, 2521 Thomas Street.
27 New York (C*), Small Bore, Salamanca. Raymond L. Abbott, 233 Highland Ave.
27–28 Ohio, Rifle Tournament, New Philadelphia. Sam Bond.
28 Montana (C*), Northwest Small Bore, Anaconda. E. J. Perro, 124 W. Park Avenue.
28 Ohio, Columbus Citizen Varmints Small Bore, Columbus. H. D. Erk, 3066 Indianola Avenue.
28 Oregon (C*), Registered Rifle, Eugene. Arthur F. Richards, 301 Lincoln.
28 Illinois (C*), State Ass'n, Aurora. M. Gawron, 3434 N. Avers Ave., Chicago.
28 Illinois (C*), State Ass'n, Decatur. M. Gawron, 3434 N. Avers Ave., Chicago.

PISTOL

6–7 New York (*), Defense Stamp Pistol, Poughkeepsie. Erven Meddaugh, City Route 31.
7 Wisconsin, Outdoor Pistol, Janesville. Walter H. Miner, Janesville Police Dep't.
7 Michigan (C*), Registered Spring Pistol, Jackson. R. V. Gray, Box 275.
7 Illinois (C*), Sheridan Club Pistol, Deerfield. B. C. Meyer, 919 Forest Avenue.
7 Florida (C*), East Coast Pistol, Miami Beach. A. J. Kelly, Jr., Box 43, Coral Gables.
13–14 New York (*), Defense Stamp Pistol, Poughkeepsie. Erven Meddaugh, City Route 31.
13–14 Texas (B), State Pistol Matches, Austin. John F. Callan, 405 East 30th St.
13–14 Kansas (B*), State Pistol Tournament, Wichita. **(Cancelled.)**
14 Michigan (C*), First Annual Pistol, Ann Arbor. Lt. C. M. Enkemann, Police Hdqts.
14 Washington (C*), Buddy League, Seattle. G. B. Gilmour, 525 Findlay St.
20–21 Illinois (C*), Summer Pistol, Lincolnwood. Joseph J. Byron, 7042 Keeler Avenue.
20–21 Alabama (B*), State Pistol, Birmingham. S. B. Bolling, 632 Alabama Avenue.
21 Maryland (C*), Summer Pistol, Sparrows Point. Marcus H. Miles, Chief of Police.

21 **Oregon** (B*), State Pistol Tournament, Portland. John S. Altmanns, 405 N. Stanton St.
28 **Pennsylvania** (C*), Phila. Marksman's Pistol, Harold Walcoby, 114 Hartrauft Ave., Norristown.
28 **Michigan** (B*), State Pistol, Detroit. Lt. Marvin Driver, Police Dept.
28 **Missouri** (B*), State Pistol, Jefferson City. V. J. Tiefenbrunn, 4841 Kossuth, St. Louis.

JULY

RIFLE

2–3 **Virginia**, Rifle Instructors School, Quantico. Major George Van Orden, Marine Base, Rifle Range Detachment, Quantico.
4–5 **Pennsylvania** (B*), Vandergrift-Carnegie Rifle, Vandergrift. R. M. Walbeck, 245 Sherman Ave.
4–5 **Ohio** (B*), Ohio State Small Bore, Mt. Gilead. C. I. Greer, Box 123, Barberton.
4–5 **Illinois** (B*), Sheridan Club Rifle, Deerfield. B. C. Meyer, 919 Forest Avenue.
4–5 **Virginia**, Eastern Small Bore, Quantico. Major George Van Orden, Marine Base, Rifle Range Detachment, Quantico.
11–12 **New York** (B*), Southern Tier Small Bore. Elmira. Neil Wheeler, Hendy Avenue.
11–12 **California** (B*), State Small Bore, Richmond. Jas. Pedroni, 205 Nat. Bank Bldg., Salinas.
11–12 **Illinois** (B*), Blackhawk Rifle, Aurora. Cora Converse, Box 153, Oak Glen.
11–12 **West Virginia** (C*) Registered Rifle, Parkersburg. R. A. Simpson, 1407 Spring St.
12 **Minnesota** (C*), Registered Rifle. Albert Lea. R. Gunderson, 1100 W. College St., Austin.
12 **Texas** (C*), Small Bore Tournament, Kilgore. Hugh P. Prince, Route 2, Gladewater.
12 **New Mexico** (C), Small Bore Tournament, Santa Fe. L. D. Wilson, 119 E. Buena Vista Avenue.
19 **Oregon** (C*), Registered Rifle, Portland. Dr. C. A. Lewis, Weatherly Bldg.
19 **New York** (C*), Registered Rifle, Rensselaer. (**Cancelled.**)
19 **Indiana** (B*), Indiana State Small Bore, Kokomo. John F. Holmes, 400 N. 4th St., Lafayette.
19 **Kansas** (C*), Sunflower Small Bore, Topeka. L. E. Brooks, Sr., 1419 Van Buren St.
19 **Michigan** (C*), Outdoor Small Bore, Flint. A. J. Marxhausen, 2521 Thomas St.
19 **Illinois** (C*), U. S. Grant Memorial, Rockford. Dr. S. A. Oren, 907 Talcott Bldg.
25–26 **Wisconsin**, Wisc. Rifle Assn. .30 Caliber, Racine. Oliver Moody, 5527 N. 35th St., Milwaukee.
26 **Indiana** (C*), Muncie Rifle Tournament. Fred Shroyer, Muncie.
26 **Wisconsin** (C*), Annual Westby-Viroqua Small Bore, Westby. Henry A. Nerison.

PISTOL

2–3 **Virginia**, Pistol Instructors School, Quantico. Major George Van Orden, Marine Base, Rifle Range Detachment, Quantico.
4–5 **Virginia**, Eastern Pistol and Revolver, Quantico. Major George Van Orden, Marine Base, Rifle Range Detachment, Quantico.
4–5 **West Virginia** (C*), Mountain States, Fairmont. Dr. F. F. Sowers, 900 Fairmont Ave.
4–5 **Washington**, Summer Pistol Tournament, Coulee Dam. Richard H. Humphreys, Box 426
12 **Washington** (C*), Buddy League, Seattle. G. B. Filmour, 525 Findlay St.
12 **Iowa** (B*), State Pistol, Mason City. (**Cancelled**)
12 **Illinois** (C*), Sheridan Club Pistol, Deerfield. B. C. Meyer, 919 Forest Ave.
12 **Michigan** (C*), Registered Pistol, Flint. A. J. Marxhausen, 2521 Thomas St.
12 **Pennsylvania** (C), Registered Pistol, Llanerch, Lawrence Oster, 2800 Township Line.
19 **Colorado** (B*), State Pistol, Denver. L. F. Markle, 1006 Olive St.
25–26 **California** (B*), California State Pistol. James Pedroni, 205 Salinas Nat. B. Bldg., Salinas.
26 **Illinois** (C*), Tri-County Pistol League, Lincolnwood. R. W. Maloney, 5553 W. Grace St., Chicago.

AUGUST

RIFLE

2 **New Mexico**, State Small Bore, Clovis. L. D. Wilson, Santa Fe.
2 **Massachusetts** (C*), Registered Rifle, Shelburn Falls. Emory C. Broadhurst.
2 **Minnesota** (B*), State Small Bore, Albert Lea. H. R. Smith, 2136 Palace Ave., St. Paul.
2 **Oregon** (C*), Finley Memorial Rifle, Portland. Ralph Pride, Route 9, Box 590 K.
8–9 **Wisconsin** (B*), State Small Bore, Racine. Oliver Moody, 5527 N. 35th St., Milwaukee.
9 **New York** (C*), Central New York Rifle, Oneida. Donald Devitt, State Police.
9 **Pennsylvania** (C*), Summer Rifle, Allentown. Alfred M. Newhard, 111 E. Susquehanna St.
15 **North Carolina** (C*), Summer Rifle, Greensboro. J. R. Holshouser, City Hall.
15–16 **Indiana**, State Big Bore, Frankfort. John F. Holmes, 400 N. 4th St., Lafayette.

PISTOL

2 **Wisconsin** (C*), Mid-Summer Pistol, Milwaukee. Leonard P. Yelg, 1028 S. 36th St.
2 **Ohio** (B*), Ohio Pistol Championships, Mt. Gilead. C. I. Greer, Box 123, Barberton.
2 **Maine** (B*), State Pistol, Auburn. Samuel Clark, Jr., % G. S. Flood Co., Waterville.
2 **Wisconsin**, Milwaukee Pistol, Racine. James D. Wenstrom, 217 N. Walnut St., Janesville.
2 **Florida** (C*), East Coast Pistol, Fort Lauderdale. A. J. Kelley, Jr., Box 43, Coral Gables.
9 **New Jersey** (C*), Mid-Summer Tournament, Trenton. Wm. Lewis, Box 1420.

Tri-State Gallery Rifle: Sioux Rifle Club's 3539 x 4000 won the team trophy at this Sioux Falls, S. D., tourney April 19 as Joe Paa and H. E. Burchfield got hot with 719 and 711 totals, respectively. This was the first gallery match held in the section and 45 shooters turned out to show they like it. Sibley, Ia., riflemen, second high team, took away most individual prizes although Stanley Chapman of Brookings, S. D., garnered Class A Grand Aggregate honors.

Falk Rifle: This second annual tournament turned out to be a success both from the angle of enthusiastic support by Wisconsin riflemen and high class shooting on April 11 and 12. Individual entries easily topped 100 and 14 squads fought it out for team honors. Competition consisted of a four-stage course of 10 shots prone, five shots sitting, five shots kneeling and 10 shots standing and top prize ended up in the possession of John Pagel of the Watertown club whose final tally read 293 of a possible 300 points. Pagel was threatened all the way but never behind. He started with possibles prone and sitting, dropped two points kneeling and five standing. Eli Cook of the Burlington Club had a pair of 49's sitting and kneeling after a possible prone, but dropped nine points standing to take second with 289. Five members of the Burlington Club—Cook, Rubach, Bulin, Swoboda and Hepburn—totalled 1420 over the same course to grab team honors by ten points over Menomonee Falls.

INSTRUCTORS SCHOOL

Rifle and pistol instructors who wish to brush up on the latest instruction methods are being offered that opportunity July 2nd and 3rd. The Marine Corps will hold a two day school at Quantico, Virginia, followed by a two day rifle and pistol tournament July 4th and 5th on that famous range. The matches will be sponsored jointly by the Marine Corps and the Eastern Small Bore Rifle Association. For complete details write Major George Van Orden, Rifle Range Detachment, Marine Base, Quantico, Virginia.

NEW HANDICAP TABLE

A new handicap table, based on the dropped point system, suitable for use in handicapping shooters in matches where the possible score is 300 points, is now available from the Western Cartridge Company, East Alton, Illinois.

The new table is being published in response to numerous requests from clubs and leagues. It augments a table published last year which was suitable for matches when the possible score was 200 points.

CLASSIFICATION CONTINUES

Some confusion has come about as a result of the recent NRA announcement concerning curtailment of the competitive shooting program. It was stated that the national ranking system would have to be temporarily discontinued. This does not mean that the classification of shooters has been abandoned. Classification of shooters according to scores fired in registered tournaments is still being carried out as in previous years.

STOLEN GUNS

Colt .45 caliber Gov't model auto, Serial # C114458. Stolen from car April 18. Notify Carmine L. Carbone, 6409 Race Street, Philadelphia, Pa.

K 22 S & W revolver, Serial # 674159. Stolen with wool-lined holster December 30 from home of Raymond W. Van Dinen, 4013 Wakefield Road, Berkley, Mich.

.38 Regulation Police, Serial #40537, stolen from car of Henry M. Stebbins, Madison Heights, Va., RD2.

CHALLENGES

Hayward High Junior Rifle Club challenges high schools or colleges: four positions, any sights five high of ten members to count. Address Bob Carden, 291 Stoakes Ave., San Leandro, Calif.

DOPE BAG ☆ ☆ ☆ Conducted by F. C. NESS

THIS MONTH:

.30 Caliber Factory Loads · .30-'06 · .300 Savage · .30-40 Krag · .303 British · 7.62-mm. Russian · 16-Gauge Shot Spread Game Loads · Trap Loads · Poly Choke Weaver Choke · Standard Choke Walther Pistol · Letters · Trade Dope

.30 Caliber is perhaps the most important small-arms caliber above the .22, and next to it would come the .25 caliber. At least to N. R. A. members the most important cartridge, next to the .22 Long Rifle, is the .30-'06 in Service issue, in commercial sporting and target loads and in handloads. With the great variety of factory loads which are made for it in normal times, the .30-'06 is almost an all-purpose caliber. In interchangeable cartridges for the .30-'06 rifle there are heavy-bullet loads, high-velocity loads and, between these two extremes, several intermediate loads, all factory loaded.

For thick-skinned tropical game Western C. Co. made a heavy-jacket 220-grain M. C. bullet for deep penetration. There was also the Peters Belted 225-grain bullet for controlled and delayed expansion. For American heavy game we had several others, including the Western 220-grain Pin Point, the Remington 220-grain Delayed Mushroom and now, the Western-Winchester Silvertip and the Remington-Peters Core-Lokt and Inner Belted bullets of the same weight, shape and ballistics. For ordinary big-game employment there were still others including soft-point and hollow-point bullets with boat-tail and flat bases in 220-grain weight.

The factory loads gave these bullets from 2300 f.-s. m.v. for the 225-grain weight to 2400 f.-s. for the 220-grain weight. These heavy bullets would drop a foot or more over 200 yards and a full yard at 300 yards, making them unsuitable for the longest game ranges. If zeroed right on the mark at 300 yards these 220-grain bullets would land nine inches high at midrange and because of the trajectory would not miss any well-centered target having a depth or vertical height of 20 inches at any distance from the muzzle up to 350 yards, the additional bullet drop between 300 and 400 yards being slightly more than one-half yard.

In the type of hunting country which permitted and often required long-range shots, many big-game riflemen preferred the 180-grain bullets which had an initial velocity some 300 f.-s. higher and six inches less drop between 300 and 400 yards. The bullet drop up to 300 yards was about 2½ feet, or again six inches less than that of the 220-grain bullet, making it a mere foot better over the total distance of 400 yards. With the midrange trajectory a couple inches flatter, this meant the same 20-inch target could be hit when centered at any range between the muzzle and 375 yards were the 180-grain load zeroed on aim at 300 yards. That is a gain of just 25 yards in practical-hitting range from the trajectory advantage offered by the 180-grain bullet.

In this 180-grain weight there are expanding bullets of several types all factory loaded to about 2700 f.-s. m.v. Some have pointed nose caps like the Bronze Point and Protected Point others are semi-pointed with open points or rounded lead tips. The Silvertip, Core-Lokt and Belted varieties are all included in this weight, also flat-base and boat-tail forms. In this general class are the 172-grain boat-tail expanding bullets of Winchester S.P. Precision type. In full-patched pointed target bullets there are also the Remington 172-grain Tapered Heel and the Western 180-grain boat-tail as well as the 172-grain M1 boat-tail Service bullet loaded by Frankford Arsenal and others. All these have about the same ballistics as the 180-grain hunting loads, but the sharply-pointed target bullets generally have a little less drop and slightly higher remaining velocity at 600 yards to 1000 yards.

For such game as deer, sheep, antelope and plains caribou, many hunters prefer the lighter 150-grain expanding bullets at high velocity in the .30-'06. Here again is a step up of 300 f.-s. above that of the 180-grain loads and, of course, a corresponding flattening of the trajectory. The particular game animals mentioned are susceptible to shock and these lighter 150-grain bullets which start out at 3000 f.-s. m.v. are very effective killers over reasonable ranges. The midrange trajectory over 300 yards is only one-half foot and the total bullet drop, but two feet. A well-shaped, sharply pointed expanding bullet, such as the 150-grain Bronze-Point has a trajectory height of less than a foot over 400 yards and a total drop of just over a yard. Although it is easy to hit with these lighter bullets they lack the remaining energy of the 180-grain and 220-grain bullets and, since they depend on a rather high striking velocity for killing effectiveness, these 150-grain bullets are best adapted for distances well under 300 yards.

The old U. S. C. Co. 145-grain Hollow Copper Point at 3100 f.-s. m.v. was in this class and it was one of the best loads ever used on deer in the .30-'06. It also killed well at lower velocities, down to 2500 f.-s. striking velocity, which made it very effective at any range up to about 250 yards. Such loads are also pretty good .30-'06 medicine for varmints, especially when applied to coyotes.

For coyotes and similar varmints there is also the Remington Hi-Speed load with 110-grain hollow-point bullet. Some hunters use it on deer and have good results on broadside hits in the chest cavity. The velocity is too high, however, to make this light bullet a reliable deer slayer. It is too prone to disintegrate before adequate penetration has been attained, especially on those quartering or end shots which hit haunches or shoulders. At long range it acts like a normal bullet after the velocity has dropped to about 2200 f.-s., and I have seen perfect mushrooms and good penetration in deer with no signs of disintegration when the range was 250 yards.

The initial velocity is 3500 f.-s. in a 30-inch test barrel. In the shorter sporting barrel it develops 3380 f.-s. m.v. and loses well over 500 f.-s. in traveling the first hundred yards. The gravity drop is two feet over 300 yards and eight inches over 200 yards. Over the latter range the trajectory height is only two inches, while midrange of 300 yards it is one-half foot. Since the additional drop between 300 and 400 yards is just over ten inches, we could hit that before-mentioned 20-inch target at any range up to 400 yards with a center hold and a 300-yard zero. The remaining velocity at 400 yards would equal the muzzle velocity of the .22 Long Rifle.

The arbitrary sectional density (W/d^2) and the estimated form factor (n) and relative ballistic coefficient (W/nd^2) of each .30-caliber bullet is shown in the following table obtained from duPont ballistic charts. The nearer the form or shape value approaches zero, the nearer the ballistic value ("C") comes to unity and the better the theoretical performance of the bullet. Bear in mind that these are only relative figures given for the comparison of bullet efficiency by one of many methods. By some other ballistic system the figures in the "C" column would be different and even some of the relative positions might be affected. These are our own reference values.

Bullet	*W/d²*	*Form*	*"C"*
80-gr. O.P.	.120	.92	.132
93 " O.P.	.140	1.05	.136
93 " S.P.	.140	.95	.150
110 " O.P.	.165	.77	.218
111 " M.J.	.165	.85	.198
120 " C.P.	.180	.75	.246
119 " Solid	.173	.77	.228
125 " S.P.	.189	.70	.273
135 " Solid	.203	.49	.419
136 " M.J.	.204	.465	.448
145 " M.J.	.218	.49	.449
147 " M.J.	.221	.49	.460
150 " M2	.225	.49	.469
160 " S.P.	.240	.49	.495
168 " H.P.	.253	.525	.485
170 " M.J.	.258	.49	.525
172 " M1	.259	.465	.560
172 " C.P.	.259	.60	.433
180 " Pt'd	.270	.465	.588
180 " S.P.	.270	.85	.320
220 " M.J.	.330	.95	.349
220 " S.P.	.330	.70	.478
225 " O.P.	.338	.88	.389

Although the flat-nose and round-nose expanding bullets have a poorer ballistic shape than pointed bullets, the difference in trajectory is so slight that the following tables of elevation can be applied for practical purposes to all bullets of equal weight and muzzle velocity over target ranges up to 600 yards and in any game field.

In the first column (A) we have all the 145-grain (3100 f.-s. m.v.) and 150-grain (3000 f.-s. m.v.) pointed bullets. In the second column (B) all the 147-grain (2800 f.-s. m.v.) and 150-grain (2700 f.-s. m.v.) pointed bullets. In the third column (C) all the 172-grain (2660 f.-s. m.v.) and 180-grain (2700 f.-s. m.v.) pointed bullets. In the last column, (D) all the 220-grain (2400 f.-s. m.v.) bullets.

TABLE OF ELEVATIONS IN MINUTES

Yards	*"A"*	*"B"*	*"C"*	*"D"*
100	2.0	2.5	2.4	4.3
200	4.2	5.5	5.0	7.0
300	6.7	8.5	8.0	10.1
400	9.5	11.5	10.8	14.5
500	12.8	16.0	15.0	19.5
600	16.5	21.0	19.1	25.3
700	20.8	26.0	23.8	31.9
800	25.6	33.0	29.0	39.6
900	31.4	41.0	34.9	48.5
1000	38.1	49.0	41.8	58.5

To use this table select the column which most closely corresponds to your load, and then pick the range at which you have fired and sighted in that load. Assume your angle

of elevation is as given for that range and add or deduct as many minutes as are indicated for any other range in the same column. For example, if you are shooting the old 172-grain M1 Service load or a 180-grain hunting load and want to go from your zero range of 200 yards to 600 yards, you will choose column "C", and note you have already an elevation of 5 minutes of angle, whereas 19 minutes of angle is the total elevation required at 600 yards. The difference between these two is 14 minutes which you must add to your 200-yard sight adjustment in order to hit the target at 600 yards.

You may find when you shoot that actually only 17.5 minutes (or even as many as 20 minutes) were required at 600 yards for your particular load and sight line, but the first shot should be on the paper and so permit an exact refinement of the adjustment for your second shot at the longer range. After firing a string to get the mean impact, or after refining your zero, make a note of this elevation, or log the final sight adjustment in your score book.

* * *

.300 Savage is virtually a short .30-'06 and with the 150-grain pointed or semi-pointed bullet it has the same m.v. and exterior ballistics as the original Model-1906 Service cartridge. Its rimless bottle-neck case is the same in head and body diameter as the .30-'06 case, but it is .58 inch shorter in overall length and its mouth is fully 1/16 inch below the .30-'06 body and shoulder juncture when the bases of both are even. The .300 Savage neck and shoulder are both half as long as those of the .30-'06 case.

This shortened .30-'06 cartridge was developed for actions too short for the .30-'06, originally in the Model-99 lever-action and then the Model-1920 Savage bolt-action rifles. Now it can also be used in a standard autoloading rifle, the Remington M-81 being made for it. We fired one of these ungainly brutes recently, in .35 Remington caliber, and had fair short-range sporting accuracy with it, but in .300 Savage caliber our Model-99T Savage deer rifle gives us 3-minute groups, handles fast and shoots well from all positions. Because the autoloader gave much better groups when we first tried it in .25 and .32 Remington caliber, there is every reason to believe that it would give a very satisfactory performance in its new .300 Savage caliber, perhaps the best one to choose in the Model-81 autoloader, everything considered.

The 150-grain bullet is given nearly 2700 f.-s. m.v. in the .300 Savage and the 180-grain bullet, nearly 2400 f.-s. The latter bullet drops 40 inches in traveling 300 yards and the former, 30 inches. The 150-grain load has a midrange trajectory of 3 inches over a 200-yard range and if zeroed at 300 yards it would hit a centered deer's body up to 335 yards. The 180 grain has a 4-inch 200-yard trajectory and would hit the same depth of target up to 275 yards when zeroed at 250 yards. Various types of open-point and soft-point bullets were made in both weights, now including the Silvertip and Core-Lokt forms.

There is also a Peters 200-grain Belted bullet at 2220 f.-s. m.v. designed for timber use on heavy game. It drops four feet over 300 yards, but only half a yard at 200 yards. This load could be zeroed on aim at 225 yards and then would hit a deer's body at any range up to 250 yards. When zeroed at 200 yards the impact or group-center lands four or five inches above aim at 100 yards, depending, of course, on the height of the line of sight above the bore axis.

The elevation tables for the .30-06 can be applied to the .300 Savage loads for practical hunting-range comparisons, by choosing the proper column for the required muzzle velocity. Thus for its 150-grain bullet use the 2700 f.s. (B) column or the 180-grain column (C) and for its 180-grain bullet, the 2400 f.-s. (D) column of the .30-'06 220-grain bullet.

* * *

.30-40 Krag, officially known as the Cartridge, Ball, .30-caliber Model-1898 when it had finally supplanted the .45-70 as our Service cartridge, came in the "Gay Nineties". One of its names was .30 U. S. Army, which it continued to be for about a dozen years, or until the Springfield rifle replaced the Krag rifle among our regular troops. The Winchester Single-Shot rifle was also chambered for this .30-40 rimmed bottleneck cartridge. Later the Model-1895 Winchester lever-action magazine rifle became popular in this same caliber for American big-game shooting.

The .30-40 case holds about 10 grains less powder than that of the .30-'06. Its typical load drove a 220-grain blunt-nose bullet at about 2000 f.-s. m.v. The round-nose Service bullet was full-jacketed with cupro-nickel. Commercial bullets were available in soft-point and metal-cased style, the .30-40 sporting ammunition with 220-grain bullets being loaded to about 2200 f.-s. m.v. Midrange trajectories for 200 yards are about 4.5 inches with a gravity drop of 44 inches over 300 yards. The trajectory and effective range would be much like that of the 200-grain load of the .300 Savage as mentioned above. In the .30-40 caliber the 220-grain loads are most effective in the game field considering range penetration and killing qualities.

Commercial loads were also available with expanding 180-grain bullets in capped-point and soft-point styles. The latter have a 9-inch trajectory height over 300 yards, the sharp-pointed bullets flying an inch flatter. The m.v. is 2460 to 2480 f.-s. Midrange of 200 yards the trajectory height is 3.5 inches for both. This is an intermediate load less effective in the .30-40 than the 220-grain loads.

For such game as deer the 150-grain bullet at 2660 f.-s. is a good one in the .30-40. It approximates the .300 Savage load and the old Model-1906 Service load in the .30-'06. In the Peters Protected Point load the 150-grain bullet drops only a foot over 200 yards and has a trajectory height of 7.5 inches midrange of 300 yards. In my own issue Krag this was the most accurate commercial load I could find. There was also a Winchester pointed expanding bullet of identical ballistics.

* * *

.303 British is not a true .30-caliber in the sense of identical diameter, as its .311-inch bullets are .003-inch thicker than those of the (.308 inch) American .30-caliber cartridges grouped above. However, it should be mentioned here because it closely resembles the .30-40 Krag, especially the old British Mark VI Service cartridge loaded with its 215-grain round-nose bullet at about 2100 f.-s. m.v. The more modern Mark VII British Service cartridge has a pointed 174-grain bullet loaded to about 2450 f.-s. m.v. The rimmed bottleneck .303 British cartridge is not interchangeable in the Krag chamber for several reasons. But it is possible to reverse the process and shoot .30-40 Krag cartridges in .303 British barrels and rifles, the latter limiting the load to 48,000 pounds pressure whereas the Krag action limited its loads to 42,000 pounds. The principal remaining reason is that of relative bore and bullet diameter. The Krag bullet would be a loose fit in the .303 British barrel, whereas the British bullet would be too large for the Krag bore and would tend to further increase the existing discrepancy in allowable pressures.

American commercial sporting loads in this caliber have the 215-grain soft-point bullet. Western C. Co. loads a boat-tail bullet of this weight and diameter. All are given about 2160 f.-s. m.v. The trajectory and drop are about the same as that of the 220-grain Krag bullet up to 300 yards. Western also loads the 174-grain bullet in open-point boat-tail style to 2450 f.-s. m.v. Its trajectory approximates that of the 180-grain bullet in the .30-40 Krag loads.

Since this is a very popular caliber in Canada, the Dominion Cartridge Company has fully developed sporting loads for it. These include the 215-grain soft-point bullet at 2200 f.-s. m.v. and a 180-grain bullet, both Copper Point and Pneumatic H.V., at 2560 f.-s. m.v. The trajectories given for the 215-grain bullets are 5.1 inches over 200 yards and 13 inches midway of 300 yards. For the pointed 180-grain Copper Point the 200-yard trajectory is 2.7 inches, and 7.7 inches over 300 yards. For the Pneumatic 180-grain bullet the respective trajectories are 3.2 and 9.0 inches.

* * *

7.62-mm. Russian is another near-.30-caliber, its bullet diameter being about .310 inch. It is a rimmed bottleneck cartridge with a broader base or head than any other cartridge in this group and that means it has a greater body taper than any of the others. It is a very good cartridge, the Russian Service load having a pointed 147-grain bullet at 2800 f.-s. m.v., and being an equivalent of our present M2 Service cartridge. There is a Remington Bronze-Point 150-grain load and a Winchester 145-grain Hollow-Copper-Point, both these sporting loads have 2810 f.-s. m.v. The drop and trajectory approximates that of the .30-'06 as already indicated for the required angles of elevation. See the table on page 44.

* * *

.230 Lovell was finally evolved into the McCrea Thunderbolt (both on belted Magnum cases) now deceased for the duration. Charges were 56 to 59 grains of No. 4350 behind Sisk or Barnes 70-grain bullets. One of Lovell's customers used 56 grains. McCrea's regular load was the same weight of No. 4064. This load would perk fine for 500 rounds with little change in accuracy, and the throat would be roughened and appear dark to an extent of a couple inches forward. Cases last for at least a couple dozen loadings, and penetration and destruction in wood equals that of the 180-grain load in the .30-'06. The usual pitch of rifling is 1-12, which is not quick enough for the Barnes 90-grain bullet. The impacts obtained with the Sisk 70-grain bullet and 56 grains of No. 4064, were ¾-inch high at 100 yards and 5½-inches low at 300 yards. In a Miller free-bored barrel, this same combination gave an inch group at 100 yards, as reported by E. G. Little.

Shot Spread. While we have lacked the time and space for reporting it before now, we have done a lot of pattern shooting with various different shotguns and loads at 20 yards and 40 yards and a few of them at longer ranges.

In as much as we have found its performance to be uniform, we usually do our basic shooting of any unfamiliar bore with the low-power and high-power shotgun cartridges loaded by the Federal Cartridge Corporation. We use the same brand of loads of both types on hand-trapped flying targets for judging the handling qualities of new or unfamiliar shotguns.

In 16 gauge, the 2¾-inch, Federal Hi-Power load is 3 drams equivalent and 1⅛ ounces of No. 6c (257 pellets by count) or No. 7½c (391 pellets by count). The 2¾-inch, Federal Monark load is 2¾ drams smokeless and 1⅛ ounces of No. 8c (461 pellets by count).

On a warm day, when the temperature was normal, 68°, we tried these loads on our pattern paper using the Poly Choke set on "Full". Beginning at 20 yards, the No. 7½c load spread 19 x 17 inches, making practically an 18-inch circle. The No. 8c load spread 14 x 15½ inches, about a 15-inch circle. The No. 6c load spread 10 x 13½ inches, about a 12-inch circle. In most cases the greater spread is vertical, making the short-range patterns slightly deeper than wide. This is only generally true; not always.

When we moved to 40 yards, twice the range, we used a 4-foot square of paper to catch the best part of the pattern and then inscribe it in a 30-inch circle. This circular area contains 78.54 three-inch squares. The No. 6c load averaged 1.92 hits per square and 151 pellets in the 30-inch circle, or 58.53%. The high pattern was 161 and the low, 142 pellets. The No. 8c load averaged 2.81 hits per three-inch square and 213 pellets in the 30-inch circle, or 46.19%. The high pattern was 226 and the low, 193 pellets.

At 20 yards the No. 6c load had put more than 90% of its pellets (practically all of them) in 15 three-inch squares, or in a circle which measured only a foot in diameter, but the best it could do at 40 yards was 62.2% in 78.5 such squares, or only 161 pellets in a circle of 2½ times that 20-yard diameter. The others, the missing shot, were cripples; mutilated or deformed pellets which had curved out of that cone whose base measured 30 inches across at 40 yards and tapered back to about .7 inch at the muzzle. At 20 yards the diameter of this same cone would be 15 inches. Note that the No. 8c load put practically its entire shot charge in such a circle, or 24 three-inch squares, at that range, while its best pattern at 40 yards was 226 pellets, or 49%, in the 30-inch circle. More than half of the charge left that cone of normal spread between 20 yards and 40 yards.

We tried another full-choke 16 gauge over the same course on the same day. The 20-yard patterns ran: 11 x 14, 12½ x 13½, and 14½ x 15 inches with the same Federal loads. In this barrel we tried the No. 7½c load at 40 yards, because it seemed to be as good as the others in the preliminary short-range shooting. In the 30-inch circle the count ran from 234 to 238, with remarkable uniformity, for an average of 60%. The average was 3 hits per three-inch square. At 20 yards this load had put practically its entire shot charge in a 13-inch circle.

In a modified-choke barrel these same loads spread about ½-foot more at 20 yards on the same day. The results were: No. 6c, 19 x 17½ inches; No. 7½c, 15½ x 16 inches; and No. 8c, 19 x 21 inches. The Weaver ¾-choke was also tried under similar temperature conditions with two of these loads, resulting in a spread of 13 x 13 inches for No. 6c and of 14½ x 15 inches for No. 8c.

At 40 yards, the No. 6c load, in the Weaver Xtra-full choke, averaged 137 pellets, or 54.6% in the 30-inch circle, with 1.72 hits per three-inch square. The high pattern was 144 and the low, 128 pellets. The dense centers of these 40-yard patterns averaged 26 x 28 inches, whereas the maximum spreads caught by our 4-foot paper averaged 35.3 x 34.3 inches. This means practically the entire shot charge went into an area comprised of 135 three-inch squares, while the dense centers of those patterns covered an area of 81 such squares at 40 yards. All the patterns discussed above were fired under normal-temperature conditions.

The 20-yard shooting with the Weaver Xtra-full choke had to be done on a given day when the temperature was slightly subnormal, or 55° F. Results, however, appeared to be normal, as the No. 6c load spread only 11 x 11 and 11 x 11½ inches and the No. 8c load spread 12 x 12 and 13 x 14 inches. In the Weaver full-choke this latter load spread 16 x 14½ and 13 x 13½ inches, while the No. 6c spread 12 x 12½ and 13 x 14 inches. Note that the latter load went into a smaller area than a foot circle when fired in the Weaver Xtra-full choke. In other words, practically the entire shot charge went into an area comprising 14 three-inch squares, whereas at 40 yards it spread over 135 such squares, the centers of its 40-yard patterns requiring 81 such squares to contain their spread.

The other day we tried a heavy double-barrel 12 gauge which had been used almost exclusively with buckshot loads on "jungle cats" in the Canal Zone. It handled beautifully and peppered flying targets without a miss. We used the Federal Hi-Power load of No. 4c, the load being 1¼ ounces and the equivalent of 3¾ drams smokeless. The temperature was normal. At 20 yards the right barrel spread 14 x 16 inches and the left barrel, 16 x 13 inches. For the sake of comparative effect I might state here that, with a 16-gauge Spreader tube, or Skeet choke, and a Skeet load, we get a 36-inch spread at 20 yards with the dense center inside a 2-foot circle.

The Remodeled Walther

LETTERS

Improved PPK Walther. Walther made two .380 pocket models; one they designated as the PP model and the smaller of the two, which is my pistol, the PPK. They also made the small model in some light metal, probably an aluminum alloy. I was much impressed with the mechanism of these pistols, especially of the double-action feature, and I bought three, the large model, the smaller model, and the light metal one. I had one of them fired 500 times without cleaning and it functioned perfectly without a jam or a misfire.

This pistol is a double-action semi-automatic with a cartridge in the barrel. By squeezing the trigger this cartridge is fired like a double-action revolver, when the pistol functions for the other six cartridges in the magazine similar to any semi-automatic pistol. The pistol has a kind of rebounding hammer and there is a vertical sliding member which is connected to the trigger motion on which the front of the hammer rests and keeps the hammer from contact with the firing pin so if there were a blow on the back of the hammer, or if the pistol should be dropped and hit on the hammer, it would be impossible for it to be discharged.

As issued the pistol was provided with a side safety which was absolutely unnecessary and it was distinctly detrimental having it. I think probably the safety was put on the pistol on account of some German law. The trigger guard was of the usual loop shape, the rear end of which was hinged to the receiver and the forward end had a square lug which went into a slot in the receiver and formed the recoil lug for the slide. By pulling down, the trigger guard disengaged this lug from the receiver when the slide could be pulled off from the rear.

I wanted an open ended trigger guard with nothing in front of the trigger. To do this I had to have a new trigger guard made

which extended under the receiver and was integral with the recoil lug which held the slide in place. This trigger guard is locked in its proper position by a sliding button catch. The position where the trigger guard is pivoted to the receiver had to be also changed. I had the entire safety mechanism removed. This necessitated a slight change in the lock.

This pistol has another rather good thing. There is a small steel plunger, the forward end resting against the head of the cartridge when it is in the barrel and projecting about ⅛" beyond the slide in front of the hammer only when it is loaded. The end of this plunger can easily be felt by the thumb in the dark, showing whether the pistol is loaded and ready to go.

I had a model of soft steel made of the trigger guard, removed the safety, and then tried it out. I found it was satisfactory and had the new trigger guard with its recoil lug made out of nickel steel. In my opinion this pistol is the fastest and most efficient of any of the pocket automatics and one of its great features is that you do not have to think or bother about taking off the safety when you want to use it in a hurry.

George Hyde did the work on this pistol. Whether he did the engraving or not I do not know. The grips are in one piece and made from a sperm whale's tooth. There is carved on the tops of the grip, on one side, my Scottie dog, and on the other side a hippopotamus. Having the hippopotamus on the grip was due to a misunderstanding between George and myself; as at first I intended to have the grip made out of hippopotamus tooth that I got in Africa, but I found that the tooth (from lying around in the heated house) had gotten so brittle that I did not want to use it, so I gave George the sperm whale tooth and told him to make the grips out of that and forgot to tell him to make a picture of a whale instead of a hippopotamus.—RALPH G. PACKARD.

* * *

Obtaining Rifle Headspace. Mr. Phil Sharpe's article in the February Rifleman was very interesting. But his method of testing for headspace, by the dummy cartridge and shim method, will not apply to Remington Model-30 rifles (and I'd like you to confirm or deny that the same applies to Enfields, if you'd be so kind).

Or it won't if your own article from page 32 of the February 1934, issue of the RIFLEMAN is still authentic. I tried the Sharpe method in my Enfield-Winchester, and I can close it on 3 razor blades. But it will not close on Raritan Arsenal's "Nogo" gauge. Which is correct, please?—P. C. N.

Answer: You are quite right about the Model-30, Model-30A, Model-30S Remington and U. S. Model-1917 rifles. The same would probably apply to the new Model-720 Remington Bolt-Action whose locking characteristics probably remain unchanged.

As a matter of fact, you can get a headspace reading with shims as high as .017 in any of these rifles, even when the headspace is normal. The only way it can be taken is with a steel head plug. In order to get it for my .25 Remington I had to borrow a steel plug from the factory.

* * *

Cheap Checkering. I would like some information on checkering the pistol-grip and fore-end of a rifle with the minimum of equipment. That is, with a bent three-cornered file and a marker.—R. V.

Answer: The cheapest equipment for checkering walnut grips and stocks would be to take a fluted or hollow umbrella rib and cut saw teeth in both sides and use it as a marker. Cut a piece of shim metal or thin copper or tin for a pattern and outline your design. Draw a couple of master lines intersecting at the middle of your pattern to form the diamonds, and then follow these, keeping a bit short of the edge, which can be embellished by a border design, using the same marker. After marking, of course, you would enlarge the grooves, or deepen them, with a bent file.

* * *

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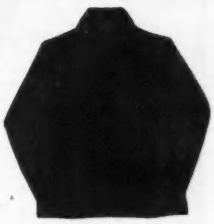

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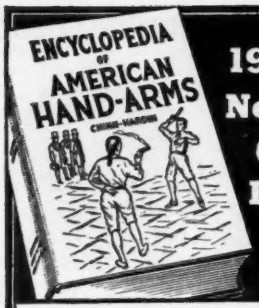

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Get your gun in shape. Clean out the primer, powder, lead, metal fouling and rust. Be ready for emergencies. Use Hoppe's No. 9. Your dealer sells it or send 10c for sample and get our "Gun Cleaning Guide" FREE. Do it now.

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150 gr. $12.50—1000 lots of 5000, $10.00 per 1000; Boattail 172 gr. $17.50—1000 lots of 5000, $15.00 per 1000. Samples two bits. 30.06 ammo wartime clips, $3.50—100; 30.06 ammo 1928-29 M.C., $5.50—100; 30.06 ammo 38-39 M.C., $6.00—100 All 30.06 cart. lots of 500, 50 cts. per 100 less. 45 Colt Auto 39.40 M.C., $4.00—100; 32 Rem. Auto M.C. & S.P., $5.00—100. F.O.B. Penna.

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Quick Method Bluing Solution

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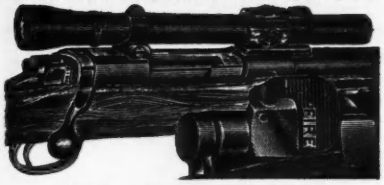
Specially Designed Mount for Alaskan and 70 Win. Mounts also tailored for Zeiss, Hensoldt, Weaver, Noske and other scopes. Fully Guaranteed. Catalog gladly sent.



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Designed for 70 Win. Conveniently located on the right side. Operates freely. Easily installed. Complete instructions. $2.50 postpaid or installed in bolt. Folder. *Due to rush defense work we are not able to make prompt delivery on all items.*

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"Everything but Alibis"

FREELAND STANDARD-D tripod $6.50. Offset Model $7.50; Freeland Arm Cuffs. $2.50; Zipper cases for your rifle scope $2.25; LUCKY FELLOW OUTFIT $6.50 Snap On Holsters $3.00 up; Handy Metal Kits for your accessories $1; KIT 38 Pistol case $20 up; Soft hats $1.25; BELTS $1.50 up; Rifle rest forks .50; cartridge blocks 60¢, $1.15 and $3.75. B&L and AO goggles and shooting glasses $7.75-$12.50. Order today. Catalogue free. *(Note the number of Freeland stocks on the firing line.)*

AL FREELAND
1112 35th St. Rock Island, Ill.

A Swell Whelen Work. American shooters of today have three great catalogs of firearms and accessories available. Each of these three thick books also serves as a handbook of useful shooting information. The Francis Bannerman catalog of miscellaneous obsolete military equipment led the way, followed by the great "Shooter's Bible" issued annually by the Stoeger Arms Corporation which is distinguished by its considerable dope on foreign arms and ammunition. Finally, the Parker-Whelen Company joined this group and formed an isosceles triangle by issuing their large annual catalog, now in its sixth edition. Each of these big books has reached the apex in its own distinctive way.

Colonel Whelen's current "Gun Handbook and Catalog" is a comprehensive work of 180 pages, 8½ x 11 inches. I know what a job it was, as I occasionally caught him working hard on it, which chore went on over a long period. It is very effectively arranged and largely rewritten including some new sections. The gun cuts, for example, are of page-width size and arranged in series on opposing pages facing the descriptions and pertinent text. The ostensible and worthy purpose of the book is to steer the customer straight, each according to his own logical requirements and then to tell him how he can gain the maximum of profit and pleasure from the purchase through effective employment of the gun or gadget. I believe Colonel Whelen has accomplished this purpose as fully and as well as could be done by printed word.

Colonel Whelen evidently has consistently kept this service purpose in mind throughout his catalog, even in the descriptive text covering listed arms and other commercial products. In addition, each different section is headed by an introductory discussion of its particular subject designed to inform the purchaser about all worthy available products in that field including the scope and limitations of each one. Such informative discussions cover small-bore rifles, game rifles, shotguns, pistols and revolvers and ammunition, cleaning equipment, accessories and sights for all of them as well as cameras of every type, photographic equipment, gunsmithing supplies and field equipment. A new section on "Boats and Outboard Motors" has been included in this new edition. In addition to the couple-dozen items in this latter section, I counted throughout the catalog half-a-hundred new items of descriptive or informative text. Fishing tackle is mentioned, but not shown or listed, although a complete line has been recently stocked by the Parker-Whelen Company.

TRADE DOPE

T. K. Lee, P. O. Box 2123, Birmingham, Alabama, is now devoting all his time to scope work and can continue his usual prompt service on installing center dots and special cross-hair reticules in target and game scopes.

* * *

D. W. Thomas suggests that gunsmiths should anticipate their walnut requirements and lay in a supply as the war-time demand is fast draining available sources of supply.

* * *

Fred N. Barnes has stopped making bullets for "the duration". He is now employed in an ammunition plant on war work. In his spare time he is cleaning up back orders as completely and rapidly as is possible.

* * *

Lawrence L. Stout & Co. will discontinue the manufacture of bullets until further notice. He is now engaged in war work with the Hercules Powder Company.

* * *

E. T. P. R. Company, through S. F. Rosenberg, announces an additional 10% discount, or a total of 20%, on the Essex Target Practice Rod to those N.R.A. members "who are serving Uncle Sam". Other N.R.A. members not yet in the Service get the usual 10% off, as formerly.

* * *

Far West Hobby Shop has issued, as usual, their comprehensive bargain list of antique and modern arms and accessories. The last one received is "Special List No. 38, March and April, 1942".

* * *

Annual Report, the 105th, for the fiscal year ended October 31, 1941, has been received from the Department of Lands and Mines, Province of New Brunswick. It is a printed bound report submitted to the governor of the province by the minister of lands and mines, and published by the government of the province at Fredericton, New Brunswick. Of particular interest to sportsmen, it includes comprehensive game-shooting and fishing reports in complete detail based on official surveys.

* * *

R. A. Litschert has brought out a new Model "A" 10X target scope with new mounts and his Model "C" 6X varmint and small-game scope with these same Litschert target mounts. Surprisingly enough, he claims an ability to supply them, at least for the time being. They are apparently fine outfits. Our report will appear after we can "give them the works".

THE ARMS CHEST

The Arms Chest is an open market trading post where manufacturers, distributors, purveyors of professional services, and our own readers may cry their wares to fellow sportsmen at a modest cost. Returns are uniformly excellent—scores of advertisers have reported truly phenomenal results.

Advertisements are accepted from annual and life members of the National Rifle Association, *for personal transactions exclusively*, at 8¢ per word INCLUDING NAME AND ADDRESS, minimum charge $1.20. For all *commercial* advertisements the rate is 10¢ per word INCLUDING NAME AND ADDRESS, minimum charge $1.50.

Groups of figures are computed as one word. Spell out all descriptive words; abbreviations may lead to serious misunderstandings and thus impair the effectiveness of your ad. Box number or blind ads will not be accepted. Please give your *complete* name and address, so as to facilitate the proper issuance of money-orders or checks, and to insure the prompt delivery of all mail or telegraphic replies. All advertisements *must* be accompanied by cash. Final closing date is the 5th of the preceding month. *Please print all advertisements plainly*—we cannot be responsible for errors due to illegible writing.

In describing the *condition* of guns advertised these standard phrases must be used: *Perfect* means factory condition. *Excellent* means new condition, implying negligible amount of use. *Very good* means practically new condition, implying little use, resulting in no appreciable bore wear and only minor surface scratches or wear. *Good* means moderate use with some finish worn off, only moderate bore wear with no pits and nothing worse than a little roughness in the bore. *Fair* means reasonably hard service, reasonable wear inside, nothing worse than minor pits in the bore, implying the gun is sufficiently accurate for hunting. *Poor* means marred appearance and pitted or badly worn bore.

MEMBERS EXCHANGE

A quick, inexpensive medium for disposing of guns and accessories no longer needed, or for the purchase of more suitable similar items. We urgently request that a full description be given of every article offered, and its *condition* (see complete instructions above), for transactions of this sort must be based entirely on good faith and mutual satisfaction. Deliberate misrepresentation will of course result in immediate expulsion from N. R. A. membership.

Purchasers who wish to examine, before acceptance, guns or equipment purchased thru these advertisements should request shipment by express, C.O.D., *with examination privileges.*

FOR SALE

THE REVOLVER TIMING RECORD. A 10-inch RCA-Victor phonograph Record. Practice Timed and Rapid Fire anywhere, BY YOURSELF. Nothing to watch—just listen. For "dry" shooting, basement and outdoor ranges. One side 10 second timing, other side 20 second timing. Plays on any phonograph, $1.50 postpaid. The Original Sight-Exchange, Box J, Paoli, Penna. 1-43

FOR COLLECTORS: SELL WINCHESTER S.S. Rifles, Mod. 76, Remington R.B., German S.S. Bolt Action, Sharps 50-70, Spencer 56-46, 50 Perc. Adams, 12mm LeFaucheaux, Rifleman, 1928—'31, Loading Tools; stamp please. WANTED—Sharps, Ballard, Rem. R.B. Creedmoor Models, Win. 38-90 Ex., also Vernier Sights, gun books, any 12 gauge factory load Black Powder; also "Pidgeon", Metal Lined, Rival, Blue Rival, Yellow Rival, New Rival (green) and Leader "Brush". Any 4 gauge, 1 or more. All letters answered. S. D. Bornslaeger, 3811 No. 21st., Milwaukee, Wisc. 6-42

.375 MAGNUM MAUSER (genuine Waffenfabrik action) by Dubiel. Open sights; 24" barrel; shot less than 50 times; used on only one hunt; perfect except blueing slightly worn in spots; action alone worth more than $100.00; rifle cost $275.00; price $135.00. Monroe H. Goode, P.O. Box 905, Dallas, Texas. 6-42

PERFECT CONDITION, UNFIRED .220 SWIFT Model 70, 48WJS, bases, $100.00. Perfect condition, unfired .45 National Match Stevens sights, $80.00. Ernest Fumasoli, 5937 Magnolia, Chicago, Illinois. 6-42

LARGE ILLUSTRATED MEDAL-AWARD Catalog, 10¢. Bargain Fishing Tackle and Archery Catalog Free. Weaver #330 Scope, Type "T" Mounts, $27.35. Type "B" Mounts, $31.75. 10-X Shooting Coats. Warshal's, First-Madison-BB, Seattle, Wash. 6-42

WINCHESTER 52 SUPER GRADE SPORTER "Perfect" Dark Stock, beautifully grained, Lyman 48F rear, Lyman 4 Ivory front, Henshaw Trigger Shoe, G. & H. Scope Block, installed by Winchester, cost $121.75, sell $85.00 money order. E. D. Webb, 406 Main Street, Tonawanda, N. Y. 6-42

GREIFELT & CO., O&U #1 GRADE, 12 GAUGE Ejector, 26" M&F, ribbed, fine engraving and beautifully executed every detail, heavy leather case, $250.00 value. Consider part trade. D. E. Larson, 2339 S. Ogden, Denver, Colo. 6-42

TRIPODS—DELUXE MODEL, OFFSET padded saddle. Many new features. $6.95. Standard Model, $3.50. Sperm Oil, Gun Grease, Blueing Solution, etc., for the shooter. Send for circulars. The Jaymac Co., Jackson, Michigan. tf

FOR SALE: NEW SERVICE 44-40, 4½" BARREL, holster, excellent, $30.00. Bisley 44 Special, 5½" barrel, sheepskin, very good, $25.00. Both $50.00. 48 shells with each. W. E. Lincoln, Box 272, Buzzards Bay, Mass. 6-42

ITHACA SKEET, 20 X 26" VENTILATED RIB, selective trigger and ejection, excellent to perfect, fine takedown leather case, $115.00. Winchester 12, standard trap, 12 x 30" full, solid rib, polychoke, cheek pad, very good, $70.00. Baker, 10 x 30", F&M, beautifully engraved, heavy twist barrels, very good, 160 primed empties, 24 primed brass empties, 22 hand loads, 21 factory loads, wads, reloading tools, all $40.00. Harry Hampson, Route #1, Bulger, Penna. 6-42

WINCHESTER 12 TRAP PIGEON GRADE, VERY good, $100.00. Remington 12—31 S Trap Special, perfect, $60.00. N. C. Nielsen, 117½ No. 16th St., Omaha, Nebraska. 6-42

KILBOURN-HORNET, DEADLY ON chucks and crows. 3,000 F.P.S. velocity with 45 gr. bullets, 2,900 F.P.S. with 50 gr. Your Hornet rechambered, $5.00. Magazines altered for long bullets, Winchester, Savage, $2.00. Lysle D. Kilbourn, New Hartford, N. Y. tf

EXCELLENT, HEAVY BARREL 52 #46868B, Marksman stock, 48J, 17A Iron, 10 power Target-spot, sheeplined case. First $100.00 takes all. A. B. Campbell, Greensburg, Kansas. 6-42

AUTOMATIC ROLLEIFLEX with ABBEY SPEED-GUN. Perfect. Money order, $200.00. Campbell Bligh, Claypool St., Nashville, Tenn. 6-42

HISTORIC PISTOLS: GEO. III FLINT-lock long Navy pistols with Belt hooks from the Castle Collection, sold for the British Government. Used in Revolutionary War and at Trafalgar. 20" long, brass trimmed, bright and clean, extremely decorative, and in shooting order. While they last, $19.50 each. Kimball Arms Company, 20 Cambridge Road, Woburn, Mass. tf

.250 MAGNUM CONVERTED ENFIELD, 26 INCH medium heavy barrel, 8 power Winchester scope, $90.00. Excellent. .270 Winchester M70, Mannlicher stock, Noske scope, Redfield mounts, $115.00. Excellent. Details on request. F. O. Warren, 341 South Wheeling Avenue, Kansas City, Mo. 6-42

M-64 WINCHESTER .219 ZIPPER, 98-A PEEP, absolutely perfect, 100 cartridges, $55.00. Herbert Fisher, Longview, Texas. 6-42

M71 WINCHESTER, DE LUXE MODEL. PERfect condition inside and out, test fired only, sling, $65.00. 135 rounds .348 ammunition, Remington and Western. $10.00. M31 Remington Pump. Perfect condition. Cleaning rod, 100 shells. $45.00. Daniel Fleming, 3028 Glenmore Avenue, Baltimore, Maryland. 6-42

LUGER BARRELS, CAL. 30, NEW, 3¾", $4.75. Antique and Modern Firearms, Flasks, Moulds, etc. J. Serven, Box 1777, Santa Ana, Calif. 6-42

FOR SALE. TO SETTLE ESTATE. PRIVATE collection of guns, too many to describe. 14 Winchester Single Shots. All in exceptional condition. Write for list. Nellie B. Leavitt, Bradford, Vermont. 6-42

COLT S. A. FRONTIER, .44 SPECIAL, MODERN, barrel 5½ perfect, outside excellent. Small notches on grip. $37.50. S. & W., M. & P., 32-20, 6 in., nickel, pearl grips, slight chip. Excellent, in factory box, $32.50. Mold 429348, $3.00. New Ideal 44 Special tool, ammunition. Fred Grunwald, c/o Nokomis Lodge, Eagle River, Wisc. 6-42

SALE ONLY! REMINGTON 11F-12 27", ventilated, poly, pad, lovely wood, factory condition, $275.00. C. F. Tilton, Ashland, Oregon. 6-42

ANTIQUE AND USED FIREARMS. SEND 5¢ for List. H. A. Brand, 1008 Ingalls Bldg., Cincinnati, Ohio. 6-42

FIREARMS FOR COLLECTORS. PRINTED illustrative catalog #7, 1,100 items, $1.00. Large descriptive list 20¢. Far West Hobby Shop, 406 Clement, San Francisco, Calif. 9-42

NEW F:2.7 UNIVEX MERCURY; EVEREADY case, synchronizer, bulk loader, $35.00. W. Kennedy Cromwell, Brightside Rd., Govans, Baltimore, Md. 6-42

REMINGTON AUTOMATIC 20 X 26 MODIFIED, excellent. Shot 50 times. $50.00. J. C. Stocks, Tallulah, La. 6-42

FOR SALE: WINCHESTER MOD. 12, 12 GA., Heavy Duck, 30" rib barrel, perfect, seventy dollars. W. McCreery, La Junta, Colo. 6-42

FOR SALE: GOERZ UNMOUNTED SCOPE, OUTside good, inside perfect, $20.00. 25 Cal. Ideal Perfection Mould, $2.50. One Ideal Mould 38-40, 200 gr., $1.75. M. W. Rosen, Parkerford, Pa. 6-42

REMINGTON 37, VERY GOOD AND ACCURATE, Redfield sights, 10X sheepskin case, $55.00. Lyman 15 power Super Targetspot Scope, new condition in factory case, $75.00. Malcolm #4 Rifle Target Scope, 10 power, very good with Lyman mounts, $15.00. 33½ power O'Hare Drawtube Spotting Scope with adjustable steel stand, $20.00. Arm cuff and sling, 10X glove, sling equalizer, 10X Aristocrat size 38 Coat, shell block and 8½" x 9½" x 26½" velvet lined, imitation leather covered shooting box with brass corners and lock, $15.00. No trades. First M.O. or check. George H. Stratton, 726 Grand Court, Topeka, Kansas. 6-42

FACTORY SECONDS RECOIL PADS $1.00, postpaid. Complete with screws for attaching. You save $2.25. Send outline of gun butt. Prompt delivery and satisfaction guaranteed. Incor Mfg. Co., Terminal Bldg., Youngstown, Ohio. tf

EXCELLENT COLT SUPER 38, $45.00. O.M. 38 Special, good, $42.00. Good Krag cut down carbine, $22.50. V. G. Ace, $45.00. Want—K-22, K-38, Springfield or Winchester .270, Winchester Hornet. Almon Williams, Berea, Ohio. 6-42

Before you leave for active duty—

may we suggest that you turn over your sporting guns and equipment to those fellow-members who sorely need them for home-defense use!

Center-fire handguns, high-power rifles and heavy-gauge shotguns are particularly required for plant guards, auxiliary police, minutemen, etc. Likewise, target rifles and handguns are increasingly in demand for use in basic firearms training.

Send us your "for sale" ad, giving a *complete* listing of all excess shooting, hunting and sports equipment. We can sell it for you quickly—and for cash!

Final closing date for the July issue is June 5th. See above for full instructions.

The Shooters Library . . .

BOOKS FOR THE RIFLEMAN IN WAR

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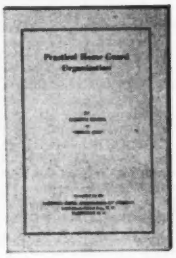

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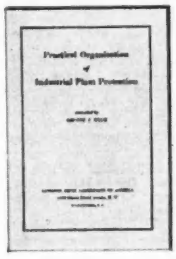

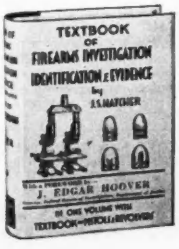

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NATIONAL RIFLE ASSOCIATION

1600 RHODE ISLAND AVE. **WASHINGTON, D. C.**

$6.00 GOVERNMENT ½" ARMOR PLATE Target Backstop, 20 x 30 inches with 8 inch bell. Crated ready for shipment. Cost $25.00. Weil's Curiosity Shop, 12 Strawberry St., Philadelphia, Pa. 6-42

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1 PIDGEON GRADE BROWNING 12 GAUGE, ventilated ribbed, single trigger, Over-Under, perfect, $150.00. 1 Heym Custom Mauser 7mm Deluxe, single trigger, circassian stock, excellent, $175.00. 1 S. & W. K-22 Outdoorsman, perfect, $45.00. 1 Colt 38 Super Auto, new condition, $45.00. 1 Owens Custom Mauser 250-3000 cal., Boehler Antinit barrel, Zeiss scope mounted and case, excellent, $225.00. Elmer C. Breuer, 3616 Traynham Rd., Shaker Heights, Ohio. 6-42

SPRINGFIELD SPORTER, VERY GOOD TO BETTER, $75.00. Letters answered. E. Stimson, New Egypt, New Jersey. 6-42

FOR SALE: SELF-EXCITED 110 VOLT AC GENERATOR, 1 KW, factory condition. Fair 25-20 S.S. Tool and Mould, decapper plug missing. WANT—45-70 Tool and Mould. Neil C. Terhune, Paxton, Nebr. 6-42

LARGE STOCK OF FINE ANTIQUE American and European arms. Send 10¢ coin for 8th edition catalog. We do fine antique arms repairing. Can furnish springs and make missing parts. Moderate prices. Kimball Arms Company, Woburn, Mass. tf

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JOSEF GOESSL OVER AND UNDER EJECTOR, 9.3X72mm, Hensoldt scope, extra set 16 gauge shot barrels, relief engraving, more than thirty heavy gold inlays, perfect, $1,500.00. Purdey, 12, Whitworth barrels, very good, $550.00. Holland and Holland, .465 ejector, excellent, $600.00. Several 14/0 swordfish reels. Dr. Richard Sutton, Kansas City, Missouri. 6-42

COLTS NEW SERVICE 44 SPECIAL, 2 INCH barrel, special rounded grips, special hammer, hand finished action, checked back strap, perfect condition. Shoulder holster. $40.00, or will trade for Colts National Match 45 Auto in same condition. Dr. C. A. Pfafflin, 445 Bankers Trust Bldg., Indianapolis, Ind. 6-42

M52 HEAVY BARREL 1ST SPEED ACTION type, beavertail stock lengthened, heavy aluminum adjustable butt, detachable walnut cheek. Especially accurate smokeless. Perfect in, good out. Vaver front Lyman tube rear, $75.00. Vaver front only $55.00. Waltham 17 Jewel 14K open face watch scroll CSW $40.00. Clyde Winfield, 598 Madison, New York City. 6-42

FOR SALE: WINCHESTER MODEL 70 257 Roberts, open sights, sling, $60.00. Perfect shape. Take 22 Woodsman, 4½", in trade. Neil K. Smith, North Haverhill, N. H. 6-42

M45 SAVAGE .250-3000, VERY GOOD, $35.00. Winchester 38-55, good, $20.00. Daly 3-barrel 38-55-12 shot, bores pitted, otherways good, $20.00. WANT—Krag Rifle .30-30 Carbine. Goff Bailey, Kincheloe, W. Va. 6-42

REMINGTON SS ROLLING BLOCK, CALIBRE 7mm Mauser, excellent. Lyman tool, #285938 Bond Mould, 40 cases, 250 F. A. primers, $23.50. WANT—Weaver 29S. Dr. C. G. D'Oench, 607 N. Grand, St. Louis, Mo. 6-42

VERY FINE 220 SWIFT ON MAUSER ACTION, speed lock, scope blocks, 48 Lyman, 1 inch sling, detachable swivels, trap butt plate, horn tip, finely checkered, model 70 barrel, excellent, 400 factory cartridges. Will not separate. $125.00. 257 Roberts medium weight barrel by Niedner and Springfield action, excellent, $50.00. Will buy 257 Roberts cases. Campbell Bligh, Claypool St., Nashville, Tenn. 6-42

LARGE STOCK OF DEER RIFLES, S. S. Rifles, Shotguns, and Revolvers. Descriptive list, 10¢. T. J. Cooper, R#7, Meadville, Penna. 7-42

WINCHESTER 24 DOUBLE 12-30, FIRED 15 times, stock refinished hand rubbed oil, $25.00 delivered. Harry O. Anderson, Ouray, Colorado. 6-42

THE MUZZLE-LOADING CAP LOCK Rifle. Splendidly illustrated, buckram binding, $4.85. N. H. Roberts, Author, Goffstown, N. H. 6-42

IDEAL TOOLS .38 SPECIAL, $3.00. .30-30 COMBination Mould, $6.00. Moulds #257312, 358242, 358246, each $2.50. 10 Gauge Brass, primed, unused, $3.00 (50). 1100 cast #257388 Bullets, $5.00. Crimper, 10, 12, 20 gauge heads, $2.00. Powder Measure #5, $4.50. 50-70 Springfield, Remington action, 30 cases, very good, $10.00. Mauser bayonet, $2.00. Postage extra. James FitzGerald, North Scituate, Mass. 6-42

SPECIAL PRICES: LYMAN, WEAVER, Scopes. New Bridge-Type Redfield Mount. Weaver Model 29S Scopes, $12.55. Stock Reloading Tools, Bullets, Primers, Cases, Powder. Free! Gun Catalog. Special! Gov't Oilers and Cleaners, 29¢. Warshal's, First-Madison-BB, Seattle, Wash. 6-42

COLT ACE, EXTRA CLIP, NEW HOLSTER, EXcellent in, good out, $40.00. Colt 38 Special, fair, $12.00. WANT—38 Military and Police, excellent. M. Martin, 3920 Grand, East Chicago, Indiana. 6-42

RIFLEMAN 1923-1942. COLT 25 AUTO, EXCELlent. WANT—X-Ring bullet trap, spotting scope. Claude Hodge, Coeur d'Alene, Idaho. 6-42

MUZZLELOADING REVOLVERS. COLT and Remington 44 and 36 caliber revolvers in fine shooting order, also moulds. Stamp for list. Kimball Arms Company, Box 257, Woburn, Mass. tf

SINGLE SHOT HORNET, WINCHESTER CONverted musket, low side wall, action excellent, barrel poor, with Winchester 8X scope, $25.00. Ideal #5 Powder Measure, new, $6.50. 3 lbs. Hercules 2400, 3 lbs. DuPont 4227, 2 lbs. DuPont 15½, lot $10.00. 50 new unfired .30-06 primed cases, 200-110 grain O.P. and 200-150 gr. pointed expanding 30 cal. bullets, lot $11.00. M. Paul McQueen, 225 Capitol Boulevard, Nashville, Tenn. 6-42

COLT NEW SERVICE, 38X5", PERFECT, FIRED once, stippled top, fine holster, $55.00. O. M. 38x6", V.G., $47.50. With Roper stocks, $54.00. Army Special 32-20x6", V.G., $30.00. 25 Auto, pearl, excellent, brush, $16.00. 45 New Service, target sights, refinished, $30.00. S. A. A. 45x4-¾", class "C" engraved, pearl stocks, silver plated, good, laced holster, $50.00. S. & W. 38x6", new nickel, $32.50. 20x28 O&U Ranger, perfect, $35.00. Lefever 20x26, IC&M, perfect, $39.00. Remington "Sportsman Skeet", VR barrel, Comp., case, beautiful wood, $85.00. Extra 28" rib, mod., barrel, $20.00. Both $100.00. Savage Hornet, 410 Combination, excellent, $25.00. Enfield Sporter, extras, good, $45.00. Marlin 36A-DL-30-30, DeLuxe Rifle, sling, perfect, fired sighting, $50.00. 6 boxes 110 gr., 6 boxes 170 gr. Silvertip, $18.00. Both $65.00. James Allen, London, Percussion Double, engraved, $18.00. Abercrombie Forester Tent, 7½x9½, carrying bag, 9 lbs., cost $25.00, never used, $17.00, or best trade. Pacific Tool, .30-06, tool steel die, new $18.50. Scale, weights, new, $6.00. Ideal #3 38 Spec., $4.50. Tool, Mould Combinations, 38, $4.50. 30-30, $4.50. 32-20, $4.00. 100 32-20 Cartridges, $4.00. 200 1940 45 Auto Cartridges, $8.00. 200 late F.A. Cases, fired, $4.00. 400 #311413 Squibbs HP Cast Bullets, $5.00. Following articles all wanted: Colt O.M.T., Army Specials, S.A.A. High Standard "A". Shotguns. Savage 23D 219 Hornet, Utility Combinations. Winchester 75-52-70-71-94. Remington 513 37. Stevens 22x410. 30-06 Sporters. Number low priced rifles, shotguns, revolvers. Give complete descriptions, best prices. 29S 330 Weavers. Reloading equipment. Components, Ammo. Lion Rug. Gun books. What? Cash. Trade. See May ad. Mail, stamp answered. Member. Gordon Joslyn. Greenfield, Mass. 6-42

38 SPECIAL BISLEY, 5½, BLUE, IVORY, EXcellent, $50.00. 45 S. A., 7½, blue, inside excellent, $27.50. 44-40 S. A., 7½, fair to poor, $12.50. 45 D. A. Frontier, very good, $20.00. Alex H. Davis, 55 E. Washington St., Chicago, Ill. 6-42

RANGER .22, tube magazine, $16.00; Western Field .22, clip magazine, with scope, $18.50; Stevens .410 Bolt shotgun, clip magazine, $15.00; Ranger 16 Gauge Bolt Shotgun, tube magazine, $17.50; all above excellent. Stevens Model 66 .22, Ranger 4X scope, swivels, good plus, $16.50; Colt M1917 .30 Machine Gun and tripod, legalized, excellent in and out, $65.00; S. & W. .35 Auto, excellent in, very good out, $18.00; eleven years American Rifleman, 1931 to 1941, inclusive, only 3 missing, $10.00; 44 Army Ordnance, 1927 to 1941, $6.00. R. Huddleston, Linwood, Mass. 6-42

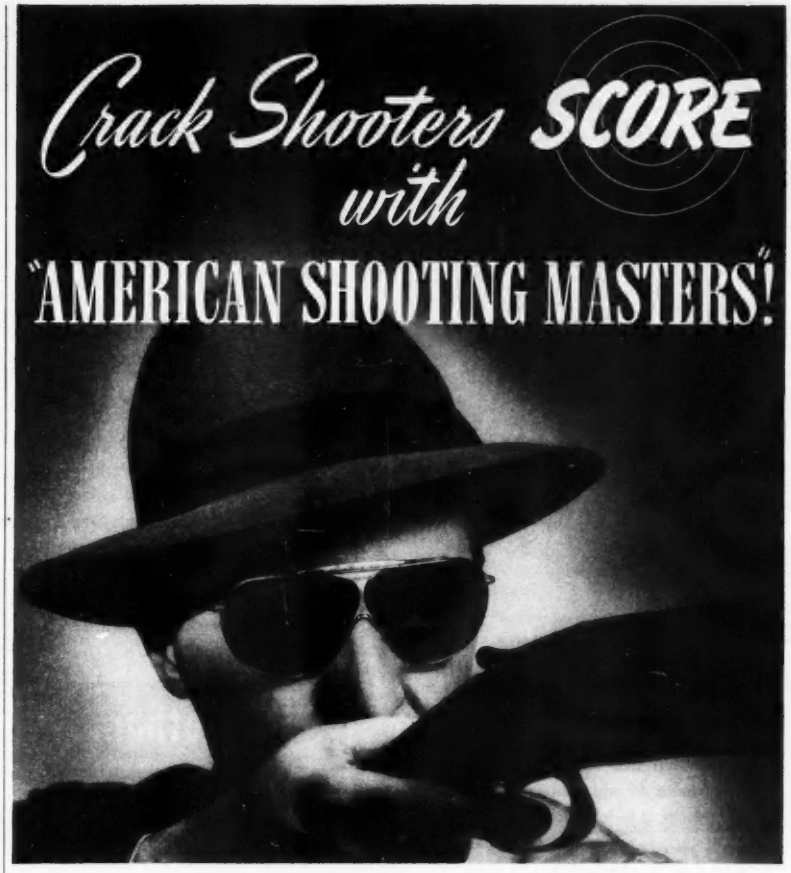
GOOD KRAG SPORTER, $25.00; FAIR M-20 Savage .250-3000, $27.50; good .38 O.M. Colt, 7½", $45.00; .22 S. & W. S.S. 10", new barrel, $25.00; Winchester 52 Bull-Gun, Vaver sights, excellent, $89.00; without sights, $69.00; good Winchester standard barrel 52, Hart speed-lock, Lymans, $56.00; B. & L. good 19.5 power telescope, prismatic, $45.00; Winchester '97 Shotguns, good, cylinder, $22.50; fair, full, $17.50. WANT—12 or 15 power Super Targetspot. Harry Brill, Route #5, Tulsa, Oklahoma. 6-42

WINCHESTER #70, 30-06. Lyman 48 rear, 17A front, with leather bound sheepskin case, $75.00. Without case, $70.00. Heavy Barrel 52, Marble extension rear, 17A front, #52889B, $65.00. Both rifles excellent inside and out. G. H. Grant, Alamogordo, New Mexico. 6-42

M. T. WOODSMAN, KING HALF RIB REAR Sight Berdon anti-slap, excellent, $50.00. WANT—Excellent Colt .22 Bankers Special. R. Niven Stall, 1924 N. Talbot, Indianapolis, Ind. 6-42

THE ORIGINAL SIGHT-EXCHANGE, BOX J. Paoli, Penna. Gun Sight Specialist. Mail us your old sights and tell us what you want. 6-42

F.O.B. SHEBOYGAN. WINCHESTER 72, 80A rear, excellent, $16.50. Winchester 67 Junior, 55W rear, sling, excellent, $9.50. Hi-Standard B 4½, holster, perfect, $25.00. Lester Tupper, 1913 N. 11th St., Sheboygan, Wisconsin. 6-42



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FOR SALE: 6,000, .38 SPECIAL EMPTIES, IN original boxes, in excellent condition: $50.00, or perfect Targetspot, 10X or 15X. P. C. Lott, R.D. #1, Duncansville, Pa. 6-42

FOR SALE TWELVE REVOLVERS: TWO GOOD American Double Action, nickel finish, .38 S. & W. and .44 Webley, $4.00 each; two nearly new Iver Johnson, nickel, 3-inch barrels, .32 S. & W., $7.00 each; one ditto very good, $6.00; one good H. & R. nickel, 6-inch barrel, perfect inside, .38 S. & W., $7.00; one nearly new Hopkins & Allen, Forehand Model, nickel, 3-inch barrel, .32 S. & W., $7.00; one fine H. & A. Safety Police blued finish, 4-inch barrel, .38 S. & W., $8.50; one nearly new H. & R., nickel 3¼-inch barrel, .38 S. & W., $7.00; one ditto in Iver Johnson make, $7.00; one nearly new H. & R. nickel, 4-inch barrel, .32 S. & W., $7.00; one nearly new H. & R. premier model, nickel 3-inch barrel, .32 S. & W., $7.00. Box 107, The American Rifleman, 1600 Rhode Island Ave., N. W., Washington, D. C. 6-42

PRACTICE ROD. READ "DOPE BAG", March issue 1942. Essex Target Practice Rod Company, 265 River Street, Orange, New Jersey. 6-42

BINOCULARS, ZEISS DEKAREM 10X50 LIGHTweight, wide angle, latest model, brand new and perfect, $225.00. Howard Martinez, 215 Hathaway Lane, Merwood Upper Darby, Penna. 6-42

FOR SALE: .30-06 SPRINGFIELD AS ISSUED, excellent, $30.00. WANT—Winchester 12 Duck and Goose. .30-06 Model 95 Winchester Carbine; Krag; all excellent. Warner Corwin, Lake City, Mich. 6-42

WINCHESTER 54 HORNET, PEEP AND 17A, excellent, $50.00. Super Fox, 3" chambers, custom high grade, 32" fluid steel barrels, excellent. Parker D.H.E., 12-30, excellent. Starrett Mike, 226, 1-2. Same 3-4, perfect ten each. H. Dean, East 3011 Wellesley Ave., Spokane, Wash. 6-42

THINNING OUT MY GUNS, ITHACA 12 GA. Featherlight Pump, $50.00, perfect. .30-06 Remington Enfield Sporter, $45.00. Many others. Bullets, Moulds, Cases, lot Ammunition. WANTED—Handguns. Stamp please. J. Ed. Minnich, Waynesboro, Penna. 6-42

BROWNING O.U. 12-28, IC&M, TWIN SINGLE, excellent, $75.00. Hepburn Surkhamer Hornet, 26" tapered barrel, circassian hi-comb stock, windage peep, excellent, $50.00. 44 Russian S. S. Pistol, 10" fluted 12 groove barrel, excellent, $35.00. 22 S. & W. Kit Gun, target grips, excellent, $40.00. Winchester 70, 270, sling peep sight, 3 boxes ctgs., excellent, $75.00. .30-06 Springfield, fair, $35.00. Colt 22 Conversion job, good, $18.00. 29 Weaver Scope, $8.00. Very good, D.W.M. 30 Luger, 3¼", fancy holster, extra magazine, 200 ctgs., $45.00. Win. 12-16, 26" full, perfect, $50.00. 45-70 Sharps Borchardt, good, $20.00. H. & R. 22-3" New Defender, excellent, $25.00. Colt 32 A.C.P., good, $15.00. Win. 12-20 25" full, good, $25.00. 8x24 Mirakel Daylux Binocular, $20.00. Oluf Bearrood, Comstock, Wis. 6-42

ENLISTED MEMBER, SOMEWHERE IN SOUTHwest Pacific (?) writes, "sell or trade, *only*, for war stamps". Win. '97 16-28, full, excellent in, fair out, $23.00. L. C. Smith Double Hammerless, 12-30, full, fair, $20.00. Riverside Double Hammerless, 12-30, full, mod., fair, $18.00. Lefever Nitro special, 20-28, full, mod., Jostam pad, good, $27.00. Lefever Double Hammerless, 12-32, full, fair, $18.00. Double Hammer, 12-30, mod., fair, $7.00. Double Hammer 410-26, full, 5 lbs., fair, 100 3-inch Super X, $15.00. Greener Double Hammer, 10-30, mod., fair, 75 Nitro Ex, $15.00. Stevens Bolt, clip, Repeater 410, 3 inch, good, $10.00. Stevens Single, Bolt, 410-3 in., good, $6.00. H. & R. Single, ejector, 20-28, good, $6.00. Krag, 22 in., Rice peep, Jostam pad, sling, 40 ctgs., excellent in, fair out, $24.00. Marlin 38-55, 20 in. Smokeless steel, 2/3 mag., fair, $14.00. Win. '90, 22 W.R.F., fair, 200 Hi Speed, $12.00. Colt P.P.S., 32-20, 4 in. blue, hammer spur, front of guard removed, excellent in, fair out, $20.00. Bolt action, single shot pistol, 7 inch barrel, good in, poor out, 500 Kleanbore, $6.00. Crosman single shot, 22 cal. Air Rifle, good, $8.00. Wollensak 4 power scope, mounts, bases, screws, $7.00. Weaver 333, S-5 mount, $7.00. 12 Ga. 32 S. & W. supplemental chamber, excellent, 50 Kleanbores, $4.00. Case (500) Federal Monark 12 Ga. 3¼-1⅛ 4 ch., $18.00. American Rifleman, 10 years, '32-'41 complete, good, $10.00. F. A. Baker, Donnelly, Minn. 6-42

J. P. SAUER & SON, THREE BARREL hammerless, (Krupp steel barrels) 12-28, modified and full, 30-30 rifle calibre. Excellent, $135.00. L. C. Smith Specialty Grade, 20-28 ejectors, selective single trigger, pad, modified and full, excellent, $135.00. Fox Sterlingworth 12-30 modified and full, very good, $42.50. Winchester Autoloading Gun Model 1911, 12-28 full, very good, $37.50. Savage Sporter, 25-20 calibre, excellent, $24.50. 1200 rounds Peters Rustless, calibre "30-03" Soft Point Cartridges. 220 grain, for model 95 Winchester Rifles (not for rifles chambered 30-06) $9.00 per 100. We buy, sell and exchange all types of good used Firearms, Binoculars or Photo Equipment. Just ship us what you have and we'll gladly send our best price. M. & H. Sporting Goods Co., 512 Market Street, Philadelphia, Pa. Established 1867. 6-42

CUSTOM BUILT 300 MAGNUM BULL GUN, 30 inch Winchester barrel, Enfield action, beautiful walnut stock, detachable cheek piece, Scheutzen Butt Plate, cost $175.00. Shot 200 times. 250 rounds match ammunition. New, Lyman, Jr., Target Scope, 6 power. Fitted mahogany case. All for $150.00. E. F. Plantamura, 11233 Hortense St., North Hollywood, Calif. 6-42

HIGH GRADE LUGER, .30 CAL., 4¼" BARREL, D.W.M., grip safety, American Eagle on barrel, finely checked stocks. Hand carved Mexican holster, 147 Kleanbore cartridges. Gun has been used little, condition excellent. Outfit $68.00. WANT—M70, 220 Swift, will consider M70 in other caliber. Also want Colt .38 Officer's Model H.B.; S. & W., M. & P., .38 cal. and M64 or M94 30-30. Must be excellent or better. R. H. Burmeister, 2802 W. Lincoln Ave., Milwaukee, Wisc. 6-42

LYMAN SUPER TARGETSPOT 12X, EXCELlent. Remington 37 A. R., perfect. Remington 30S, .257 with Belding & Mull Marksman Scope, will sell separately, excellent. Lyman Alaskan in Redfield Jr., new. James Derr, Route #2, Lititz, Penna. 6-42

FOR SALE: ONE BAUSCH & LOMB 7X35, BRAND new, $85.00. One 18x50 Hensoldt Gebirgs-Dialyt, perfect, $85.00. George Portman, Jefferson St., Wausau, Wisconsin. 6-42

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ENFIELD SPORTER, DARK WALNUT CHEEK piece stock, nickeled bolt matted receiver, Springfield front, tapped for receiver. Rubber recoil. Good condition, $40.00 money order, please. Winchester Enfield Barrel, excellent in and out, $10.00. Both $47.50. Frank Carter, Box 72, Briggsdale, Ohio. 6-42

.32 COLT POCKET POSITIVE, BLUE, 3½", EXcellent plus, $25.00. .45 Colt U. S. Army Model 1909, $17.50. B. R. Gardner, Salyersville, Ky. 6-42

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VERY GOOD 30" KRAG, TAPPED FOR WEAVER T1 mount, $26.00. Redfield Jr. Model 70 mount for Weaver, new $8.50. Ideal #3 38 Special tool and bullet sizer, new condition, $5.00. Money orders. C. A. Graves, 632 North Linwood, Indianapolis, Indiana. 6-42

WINCHESTER 52 SPORTER WITH REDFIELD Junior Base, excellent, $80.00. Winchester Trap Grade, 20 Gauge, ribbed, full choke, perfect, $55.00. WANT—Swift cases, large rifle and pistol primers. R. B. Sisk, Iowa Park, Texas. 6-42

SELL: WINCHESTER .348, 20". $60.00. Savage 25-35, new 26 inch Oct. bbl., $40.00. 52 Bull-Gun, Vaver sights, 7/8" groups, $92.50. S. & W. 44 Spl. 6". $40.00. .30 Luger 3¾", $35.00. Stevens "Gould Model" 10", $40.00. All fine to excellent. 2" Unertl, 10X, $120.00. Hensoldt Klein-Dialyt, $45.00. 10X50 Hensoldt, $100.00. .280 Ross, $40.00. 300 others. Will trade. Fred X. Johnson, Grand Ridge, Ill. 6-42

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SPECIAL SALE OF NEW AND USED shotguns and rifles. List ready. Stamp please. Kimball Arms Company, Woburn, Mass. tf

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.303 SAVAGE TAKEDOWN, VERY GOOD, $35.00. 9mm Luger, holster, pre-war 4", very good, $40.00. 500 9 mm cartridges, .25 Colt Automatic, excellent. .32 Savage Automatic, good. S. & W. .44 Schofield, fair. 100 each .25, .32 Auto Cartridges, 4,000 .22 L.R. cartridges. Chas. Drescher, 1145 Erieview Rd., Cleveland Heights, Ohio. 6-42

22 P.P.T., $40.00. 38 M&P, $35.00. WIN. 12-16-26 mod., $36.00. Krag Carbine, $25.00. B. & L. 8 x 30, $80.00. 28 Colt, cased, $30.00. Rem.-Rider, $20.00. .44 Rem. C&B, reblued, $14.00; same, ramp, $25.00. U. S. Haston 1842, $15.00. Percussion pistol, $12.00. Flintlock, $18.00. .32 S. & W. squeeze-handle, $18.00. 32 H.E., $12.00. .32 H&A, $5.00. .32 I.J. tip-up, $5.00. WANT—357; hinged steady-rest, Universal chuck for 10" Atlas lathe. R. E. Rhines, 310 Eleventh St., Franklin, Penna. 6-42

BINOCULARS: 7 X 50 BUSCH (GERMAN) CENter focusing, Featherweight and carrying case. Perfect. $150.00. R. C. Helfrich, Chula Vista Road, Oracle Star Route, Tucson, Arizona. 6-42

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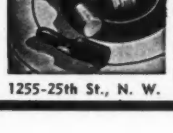

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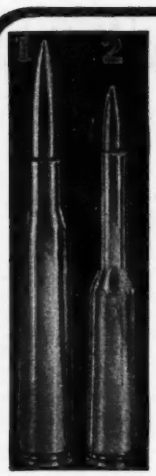

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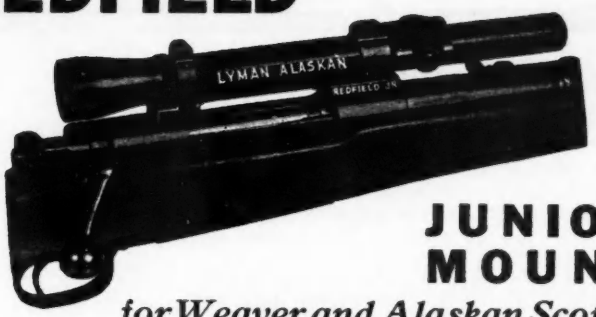

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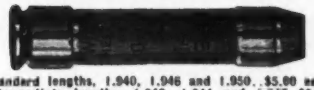

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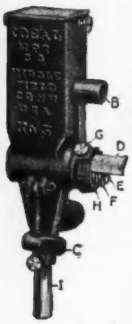

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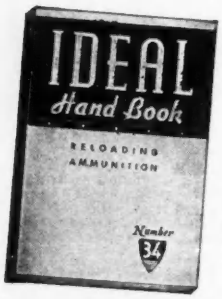

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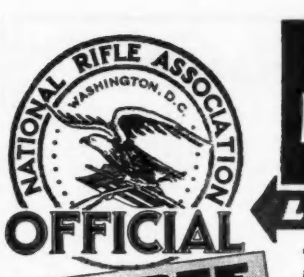

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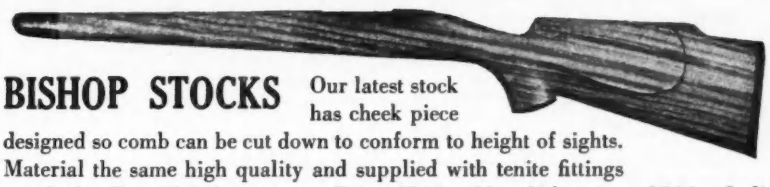

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SALE OF SURPLUS GOVERNMENT Goods. Springfield Rifle Sling Straps, brand new, $1.25. Swivels, 75¢ per pair. Leather Slings, A-1 condition, 50¢. Springfield Sight Gauges, $1.00. .30-06 Empty Brass Cases, 75¢ per hundred. 45 Auto. Cartridge Cases, fine condition, 75¢ per hundred. Brass Clips for .30-06 cartridges, $2.00 per hundred. Canvas Canteen Covers, fine condition, 25¢. Public Sport Shops, Dept. R-49, 13 So. 16th St., Philadelphia, Pa. 6-42

CANADA, THE RIFLEMAN'S PARADISE. Its true picture is given you in the pages of ROD AND GUN IN CANADA, Canada's national outdoor-life magazine. Each issue is packed with honest-to-goodness yarns of hunting and fishing in the Dominion, which has it second to none. Real stories that men can appreciate. Fine Gun Department edited by C. S. Landis. PRICE $1.00 per year. Send 10¢ for Sample copy. Rod and Gun, 1224 St. Catherine St., W., Montreal, Canada. tf

SHOT GUN COVERS. ALL LENGTHS, leather trimmed, $1.00. Precision Barometers, values up to $12.00, brand new, special sale, $4.95. Household Thermometers, new, 75¢ value, brand new, 25¢. Physicians Thermometers, pocket style with case, brand new, 4 for $1.00. Gun Oil, 1-oz. bottles, 15¢ each, $1.50 per dozen. Heavy canvas Leggings, 49¢ per pair. Public Sport Shops, Dept. R-49, 13 So. 16th St., Philadelphia, Pa. 6-42

BOY SCOUTS-HIGH SCHOOL STUDENTS: Distribute the newest patriotic novelty. Everyone wants to wear one. "Sweeping the nation!" Make yourself $8.00 to $10.00 a day. The details, and sample mailed to you upon receipt of 15¢ in coin. George Edw. Buey, 1706 North Redfield St., Philadelphia, Pa. 6-42

RECEIVED TOO LATE TO CLASSIFY

SELL: REVERE 8MM PROJECTOR, BRAND new. Vion scope 33X, fair. Best offers. WANTED—DuPont # 80, Pacific measure, electric melting pot, primer trays. TRADE—Primers, 1000 # 116 for # 1½s. Dr. H. M. Aitken, Ogdensburg, New Jersey. 6-42

MUZZLE LOADING PERCUSSION RIFLES, with all accessories, $15.00. Good barrels, for Flint or Percussion, $5.00. Fine Rifles, $20.00 and up. Lists 10¢. Geo. Brullesauer, 3957A Castleman, St. Louis, Mo. 6-42

WANT—SPRINGFIELD CAL. 30-06 AS ISSUED, barrel and stock immaterial, also Springfield receiver only and very good Remington C&B Cal. 44. Jack Walton, P. O. Box 1457, Tampa, Fla. 6-42

WINCHESTER 94 CARBINE, PERFECT, 30-30, 120 Croelock, $48.00. 94 Rifle, octagon barrel, pistol grip, excellent, 4 boxes, $40.00. 25-35, '06, excellent plus, $17.00. 30-06 Sporter, very good, $35.00. 20 boxes $30.00. 7/9 Oberndorf Mauser Sporting Carbine, excellent, $50.00. 6 boxes $9.00. Canadian Ross Sporter, 303 British, very good, 3 Boxes. Best offer. 30-06 cases, 75¢ per 100. 1000 38 Special Cases. Cartridge cases (leather) 75¢. Berth & Neuman Jena 4½X Rifle Scope, $25.00. Stereo 8 x 30 Army Pattern Prismatic Binoculars, perfect, case, $50.00. Voigtlander 8 x 24, best offer, perfect. 8 volumes American Rifleman cloth bound. Index. 1924 on. Best offer. S. Gerhardt, Jamaica Plain, Mass. 6-42

SELL OR TRADE: M94 WINCHESTER CARBINE 30-30, $35.00, M1907 S. S. 351, $40.00, Krag Sporter, $25.00, Starr .44 Cal. C. & B. Revolver, $10.00, Ranger Mo-Skeet-O Trap, $4.50. Paul Popham, Herrin, Ill. 6-42

MODEL 21 TRAP 12-30 SOLID RIB, $115.00, same ventilated, $165.00. Both perfect. Crown Smith Double Trap 12-32, $325.00. Sporters—Springfield 30-06 $35.00, $45.00, $80.00, $85.00. Mausers, 30-06 $60.00, 7mm $70.00, 8mm $55.00, Enfield $40.00. Excellent B.S.A. Centurion .22 Target, $75.00. Enfield issue excellent, $30.00, same with amateur sporter stock $30.00. Complete action with new barrel cut to 24" no front sight, $20.00. Springfield issue, low number, excellent in, very good out, $40.00, same without stock, $30.00. General gunsmithing. Stock blanks to order or inletted. Herman Treptow, Milltown, N. J. 6-42

SELL OR TRADE: HAVE .37 AND 20X2" Unertl, cost $200.00. Want movie outfit. Will pay difference. B. L. White, San Anselmo, Calif. 6-42

WANTED—REMINGTON OVER-UNDER SKEET Gun. Will pay $65.00 cash. L. W. Johnson, Waupaca, Wisc. 6-42

SMITH & WESSON K-22, 4". King ramp front, gold patridge. Fancy magna stocks. A-1 shape. WANT—Bausch & Lomb Binoculars, 8X—30. C. B. MacGowan, 89 Main St., Easthampton, Mass. 6-42

WANTED—22 PISTOL, 45 AUTO, 357 MAGnum, 38-32 S. & W. Sell 7.63 Mauser, fine, $35.00. Don Gowen, 322 Plant, Tampa, Fla. 6-42

WINCHESTER 70 SUPER GRADE .270 OR 7MM. Bore and action perfect. Outside excellent or better and unaltered. Express C.O.D. with examination privileges. Full description and lowest cash price please. Chas. H. Trotter, 3335 West Michigan, Indianapolis, Indiana. 6-42

COLT'S POLICE POSITIVE 38 SPECIAL 4 BARrel, excellent, $34.00. Ralph Dittmann, 427 W. Bender Rd., Milwaukee, Wisc. 6-42

ACKLEY R2 HI SIDEWALL, PERFECT INSIDE, pistol grip stock, cheekpiece, 1000 primers, 500 bullets, 2 lbs. 4227, 90 handloads, $37.50. WANT—Model 70 any caliber, any condition, Colts S. A. .38 or .357 Caliber, reasonable. Fred Huntington, Oroville, California. 6-42

WANTED—1000 #9½, 8½ OR 120 PRIMERS. 1000, 50 gr. 48 or 55 gr. S-S or Sisk bullets. 8X Rifle Scope. Range King Attachment. Hi-Standard. Connie Malinowski, So. Deerfield, Mass. 6-42

WANTED—SEVERAL RIFLE SCOPES, 10X AND higher. Unertl, Targetspot and Super Targetspot preferred. TRADE—Two practically new Ford 600 x 16 best grade tires 4 ply. Cash difference. Richard Bruffee, Shelburne Falls, Mass. 6-42

L. C. SMITH SKEET, $59.00. REMINGTON 20 Gauge Skeet, Cutts, $69.00. Colt 32 Auto, $19.00. Colt 380, V.G., $25.00. Johnson 2½ alternate twin pull starter, perfect, $75.00. Winchester Model 12 Skeet, matted, with Cutts, $69.00. Field Glasses, 4 power, $15.00. Savage 745 with Cutts, $95.00. Gabriel Pacciarelli, 1447 Neilson St., Utica, N. Y. 6-42

WANTED—.257 ROBERTS, PREFERABLY SCOPE mounted W70, must be very good at least. E. R. Britton, Milford, Conn. 6-42

NEW BELL-HOWELL 16MM MOVIE CAMERA and projector and accessories. C. B. Morton, 1205 Florida Ave., Bristol, Tenn. 6-42

TRADE—PERFECT MATCH TARGET WOODSman for 12 or 15X Rifle Scope. Sell 5000 Palma Match Lesmok, $45.00. Richard Bruffee, Shelburne Falls, Mass. 6-42

L. C. SMITH SPECIALTY TRAP SINGLE 34 V-R Monte Carlo stock 2½ x 1¼ x 1¼ good, $75.00. B. H. Smith, Severn, Md. 7-42

32-20 COLTS BISLEY "FLAT-TOP", $50.00. .35 Whelen Griffin and Howe, engraved, $87.50. Cartridges $2.00 box. WANT—.270. Vernor Sackett, Salem, Oregon. 6-42

BISHOP MANNLICHER STOCK FOR MODEL 70W. Inletted for 48W Lyman. Completely finished and checkered by Bishop with steel butt plate, muzzle and grip caps, Q. D. swivels. Never used. $35.00. C. A. Hope, 2010 West 5th, Gary, Ind. 6-42

WANTED—MODEL 52 STANDARD WEIGHT Speed Action; Model 75 Sporter and Standard; 16 Ga. Fox, Parker, Smith, Winchester High Grade Double. All must be excellent to perfect. Cash deal. H. King, 1701 Comer Bldg., Birmingham, Ala. 6-42

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Match grade .22 L.R. $7.95 per M—EZX's; Palma Kleanbore; Super Match; Targetmaster; DeWar Match; Police Match. (Limit 1000 per customer.)
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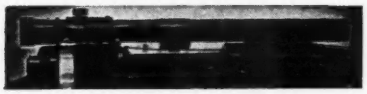

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WANTED—WINCHESTER 70, .220, MUST BE V.G. or better. Give all particulars. James M. Barry, 24 Kenilworth Rd., Wellesley, Mass. 6-42

BINOCULARS, 7x35, BAUSCH & LOMB. CASE and straps. Perfect. $75.00 cash. No trades. A. H. Wild, Springfield, Minn. 6-42

WANTED—S. & W. 22-32 KIT GUN; STEVENS Off Hand Pistol. Excellent to perfect. Also Stevens 25 rim fire ammunition. Gerald Cross, Lathrop, Missouri. 6-42

$185.00 WINCHESTER 70, .30-06. BEAUTIFUL custom Mannlicher type stock, cheek rest, checkered, engraved butt plate with trap. Lyman Alaskan, Redfield Junior mount, three leaf express sight, 48J, matted ramp front, sling, case, ammunition, excellent condition. Douglas Philbrook, 38 Myrtle, South Portland, Maine. 6-42

.45 AUTO, NEW BARREL, OUTSIDE VERY good plus, $42.50. Krag, shortened issue stock, good, $16.00. Mauser 98, shortened issue stock, bore excellent, $18.00. .30 Remington M. C. Ammunition per 100 $5.00. E. Thomson, 23 Pinckney, Greenville, S. C. 6-42

WANTED—MOD. 95 WINCHESTER CARBINE .30-06, very good, $30.00. For sale: Model 92 Winchester 25-20, fair, $14.00. Marlin Take-Down 30-30, good, $25.00. Savage O-U M&F 20 Ga., excellent, $35.00. Luger 9mm, 8", V.G., $35.00. Remington Pistol Cal. .380, V.G., $14.00. Bailey Jamison, Crook, Colo. 6-42

WANTED—.30-06 SPRINGFIELD ISSUE SPORter, perfect or excellent condition. Frank J. Andel, 5218 N. Kedzie Ave., Chicago, Ill. 6-42

SELL: AMERICAN RIFLEMAN MAGAZINES, Jan. 1937 to Dec. 1941, inclusive, price $5.00. Irvin H. Austin, Box 529, Wheatland, Wyo. 6-42

SELL OR TRADE: WALNUT HILL 417, EXCELlent, extras, $50.00. Remington C. & B. 44, good, $15.00. Colt .32 Automatic, good, $15.00. Hi-Standard II 4½, special holster, excellent, $25.00. .45 Colt Frontier 4¾, V.G., nickle, $25.00. WANT—Woodsman M.T., Kodak, 22 O.M.T. K. Lockwood, 411 Chestnut, Leavenworth, Kans. 6-42

PLEASE SELL ME A FEW PRIMERS. WILL pay 45¢ 100 for #1½, #6½, #2, or others. Need 2400 Hercules, sizer and lubricator for Hornet. Lead tester, powder measure. 45 and 30-40 mould. Woodsman or Hi-Standard. Leo Clark, Polo, Ill. 6-42

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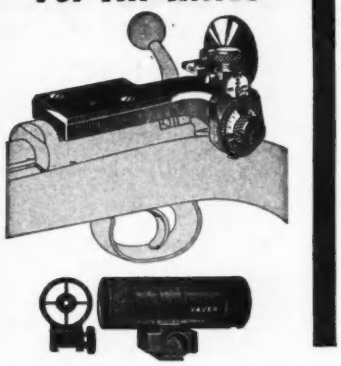

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In alternate issues of The Rifleman we have been inserting a handy order card for the convenience of shooters who wish to join or rejoin the N.R.A. This month we renew the appeal for new members by urging you to enlist the support of at least one fellow American.

Remember the Challenge: The patriotic response of N.R.A. members in the present emergency threatens to weaken our Association at the very moment when there has never been greater need for a strong, experienced National Rifle Association. For, now as never before, we need to instruct the maximum number of Americans in marksmanship fundamentals and secure the right of honest citizens to own and enjoy their guns.

We Must—We Will—meet this challenge by enrolling new members from among those Americans still at work on the home front—new members to replace those who have put on the uniform of our armed forces. You can help by using the application below. Ask a sportsman friend to sign on the dotted line—today!

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5. Introduction to a local club for instruction in fundamentals and safety, or personal help in organizing a club if there is none in your vicinity.
6. An anti-gun bulletin service which keeps you informed of anti-gun legislation proposed in Congress and in your State.

THE ANSWER

National Rifle Association of America,
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Washington, D. C.

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Here is one good recruit to help bring our organization up to full "war strength." I recommend him as an honorable American citizen of the type who will be a credit to our Association.

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(*Signature*)

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I wish to be enrolled as an active member of the National Rifle Association and subscriber to THE AMERICAN RIFLEMAN for the term as checked below:

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I pledge allegiance to the flag of the United States of America and to the Republic for which it stands.

I certify that I am a citizen of the United States and that I am not a member of any organization or group pledged to, or working for, a program aimed at the destruction of our present system of government, as established by the Constitution of the United States.

APPLICANT..... AGE.....
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